PAPER TRADE JOURNAL

Equipment Performance

May 14, 1954

WOOD PULP

G

*Established 1886*

"Let us, while waiting for new monuments, preserve the ancient monuments."

VICTOR HUGO

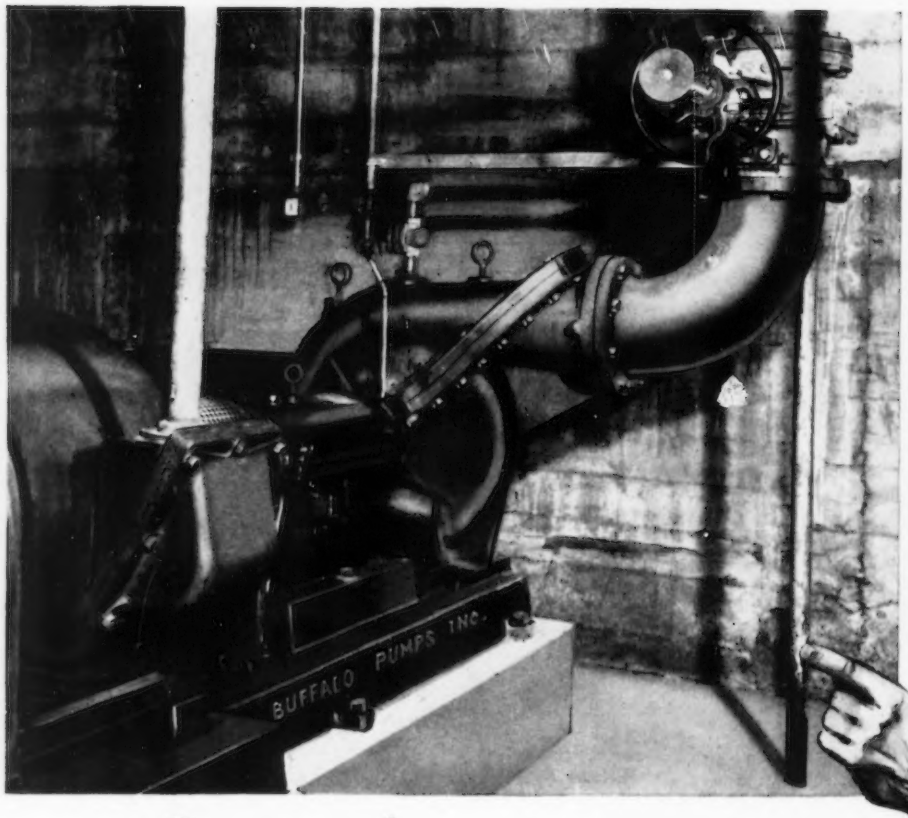
This has been the task of paper since the dawn of civilization. Future civilizations, as well, will owe much of their enlightenment to products of the Pulp and Paper Industry. Preserving the best of the ancient, it encourages continued search for the new.

**GOTTESMAN & COMPANY**

— INCORPORATED —

100 PARK AVENUE • NEW YORK 17, N. Y.

EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden




# "STEADIEST WORKER IN OUR MILL!"

Above, "Buffalo" Diagonally Split-Shell Pump specifically designed for efficient, non-interrupted moving of high-consistency stock. Has non-clogging enclosed impeller, and simple casing design for easy inspection and maintenance.

WRITE TODAY FOR "BUFFALO" ENGINEERING BULLETIN 953G

## DEPENDABLE "BUFFALO" PUMP

"I've been around pumps so long I consider them practically human. Like men, *some* pumps *start* on a job impressively . . . but, as time goes by, they become less dependable and start taking more "time off" until you can't count on their daily output. *Others* — like this Diagonally Split-Shell "Buffalo" Pump we have in our mill —work steadily and efficiently right from the start and turn in a good day's work *every* day, year after year. This Pump has been on the job for *years*, and is still going strong."

Non-clogging, high-efficiency "Buffalo" Pumps answer specific needs of the paper industry because they were designed specifically *for* the industry, by designers working closely with paper men and their problems.

"Buffalo" Pumps are built for maximum endurance—yet have simplified design for easy maintenance and fewer breakdowns. They have proved themselves to be the most practical dollar-for-dollar buy, throughout the paper industry.

Whether you need efficient white water pumping or must move steady volumes of corrosive or abrasive liquids there's a rugged "Buffalo" Pump best-suited to almost any job in your mill.

FOR RELIABLE PERFORMANCE IN THE *LONG RUN* — A "BUFFALO" PUMP IS ALWAYS THE BETTER BUY.

"Buffalo"

**BUFFALO PUMPS, INC.**

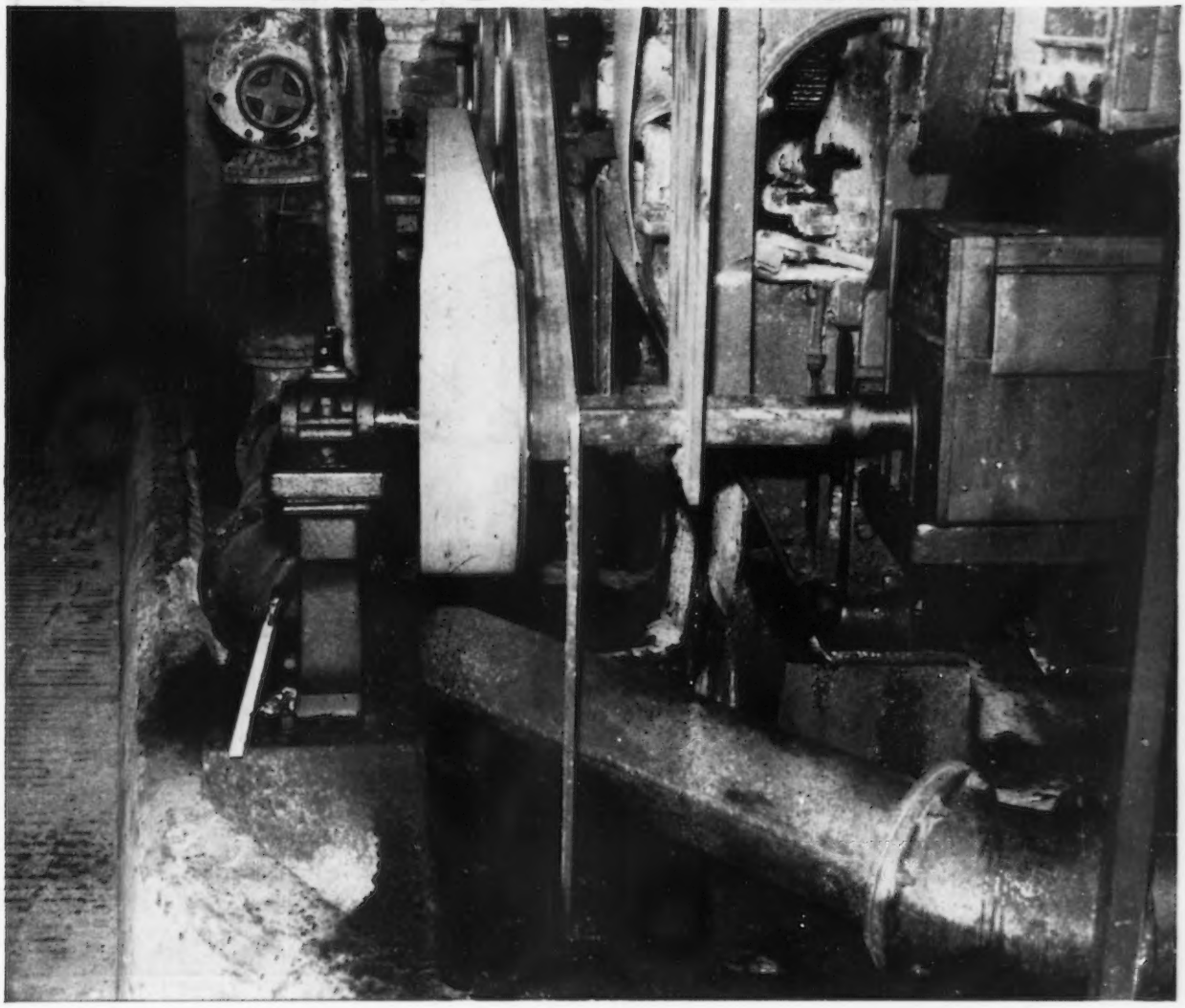
159 Mortimer St., Buffalo, N. Y. Subsidiary of Buffalo Forge Company

Canada Pumps, Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



# No slip—no slack—no shutdown with this B. F. Goodrich belt

## *Stretch reduced 50% in this all-rayon fabric belt*

B. F. Goodrich offers the first transmission belt ever made with all-rayon fabric. Called "Drivesall", it's a thinner, lighter belt, with added strength and less stretch.

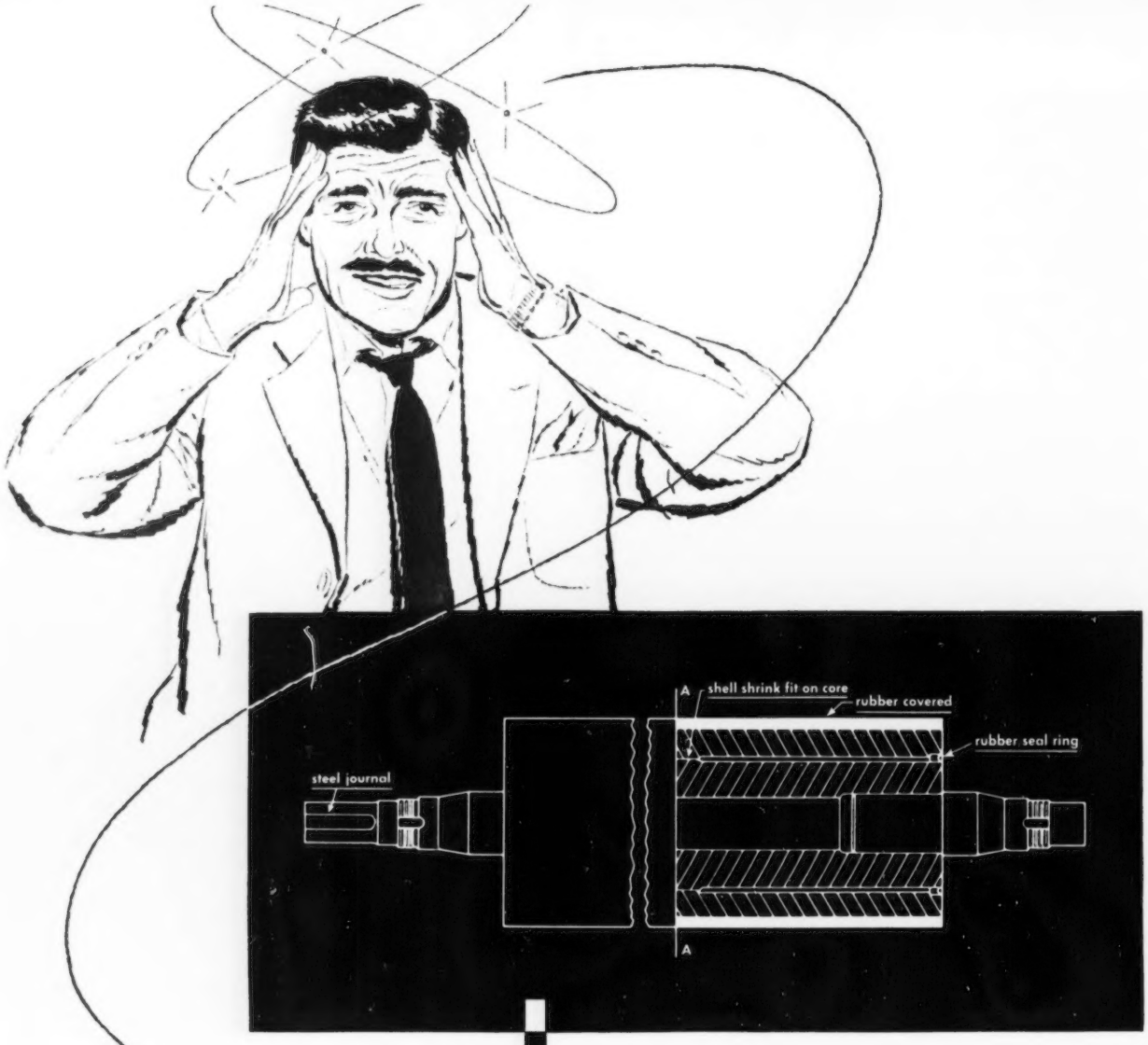
Specially woven rayon fabric gives this B. F. Goodrich belt its many advantages over medium-duty belts made with cotton. Stretch has been reduced 50% so it grips pulleys better, pulls heavier loads, requires less attention. And because it's 30% thinner, it has up to 10 times greater flex life than other belts with the same number of plies. Smaller, less expensive pulleys can be used. Wet operating conditions have little effect on the belt because it's built to resist moisture.

The belts previously used to run the rotary screen in this paper mill absorbed water. They stretched, slipped and required frequent take-ups.

Then the local distributor recommended the B. F. Goodrich rayon belt. In spite of constant exposure to splashing water, it had been at work two years when the picture was taken, without a single adjustment for stretch or slippage.

B. F. Goodrich has a complete line of belts for the paper industry. So whether you need a low stretch belt for wet conditions, an extra strong belt for an "impossible" drive, or V belts that last 20 to 50% longer, it will pay you to call in your BFG distributor. Or write *The B. F. Goodrich Company, Dept. M-245, Akron 18, Ohio.*

**B.F.Goodrich**
**INDUSTRIAL PRODUCTS DIVISION**




# eliminate the headaches

Since time immemorial the necessity of crowning press rolls and varying the crown as the anticipated pressures vary has been a headache—and costly. With the B-C crownless roll there is no crown required. The above drawing explains all.

Already a substantial list of mills have adopted this new type roll. The new board machine built for Manchester Board and Paper Co., Richmond, Va., is the first machine completely equipped with crownless press rolls. There, all plain primary and main presses have them.

Here is something quite revolutionary—and good—not to be overlooked.

**BLACK-CLAWSON**

THE BLACK-CLAWSON COMPANY • HAMILTON, OHIO

**SUBSCRIPTIONS**

U. S. $5.00 per year to pulp and paper mill and converting plant personnel, others $7.50. U. S. Possessions and Canada $7.00. Latin American Countries $15.00, all others $20.00. Single copies of regular editions are 25c. This issue $1.00.

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**REMEMBER THESE DATES**

*MAY 18:* Technical Conference, Forest Products Laboratory, Madison, Wis.

*MAY 20-21:* Executives Conference, Institute of Paper Chemistry, Appleton, Wis.

*MAY 20-22:* Joint Spring Meeting, Pacific Section, TAPPI, Pacific Coast Div., APPMSA, Gearhart Hotel, Gearhart, Oregon.

*MAY 23-25:* Spring Meeting, National Paperboard Assn., Grove Park Inn, Asheville, N. C.

*MAY 24-26:* TAPPI Coating Conference, Poland Spring House, Poland Springs, Maine.

*JUNE 14-17:* Summer Meeting, Technical Section C.P.P.A., Empress Hotel, Victoria, B.C., Canada.

*JUNE 21-23:* National Meeting American Pulp and Paper Mill Superintendents Assn., Sheraton-Mount Royal Hotel, Montreal, Que.

PAPER TRADE JOURNAL

**Published Weekly Since 1872**

MAY 14, 1954, *Vol. 138, No. 20*

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**LOCKWOOD TRADE JOURNAL CO., INC., 15 W. Forty-Seventh St., N.Y. 36**

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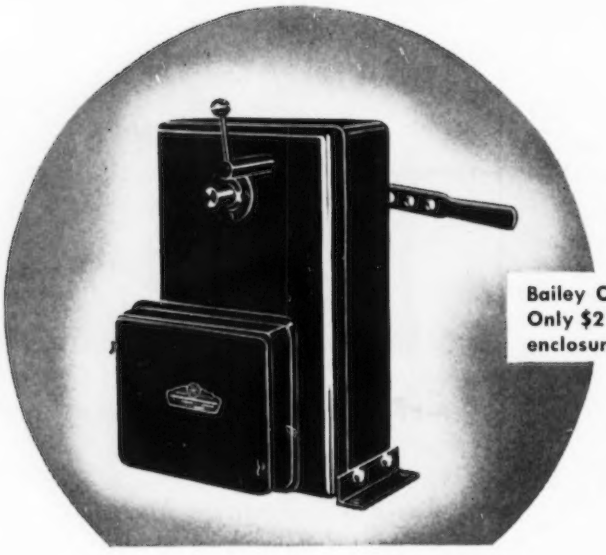


Bailey Control Drive, Type AC44P Model 200. Only $210.00 F.O.B. Cleveland, complete with enclosure, positioning relay and hand operator.

# Want Better Flow Characteristics from Your Regulating Devices?

This new, small, piston-operated Bailey Control Drive will improve the flow characteristics of butterfly valves, dampers, hydraulic couplings, feeders and similar regulating devices. Adjustment is simple; any desired relation between drive motion and pneumatic signal may be secured.

You can install this compact pneumatic drive power unit in any position on a column, pipe, or flat surface—and connect it to the regulating device with standard Bailey linkage, available from stock.

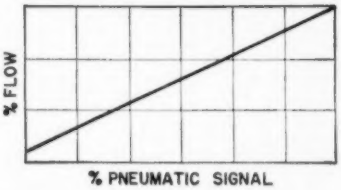
Speed (time required for full travel) is adjustable to suit your requirements. Bailey Control Drives operate on standard SAMA pneumatic signal ranges of 3 - 15 or 3 - 27 psig.

**AVAILABLE FROM STOCK in 3 standard sizes**

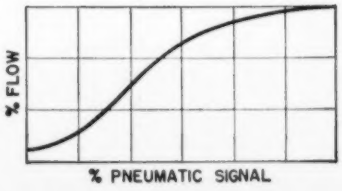
| Type | Piston Dia. Inches | Piston Stroke Inches | Torque ft-lb | Max. Travel Degrees | Approx. Dimensions Inches |
|---|---|---|---|---|---|
| AC816 | 8 | 16 | 1500 | 90 | 13 x 27 x 51 |
| AC68 | 6 | 8 | 400 | 90 | 13 x 19 x 34 |
| AC44 | 4 | 4 | 75 | 75 | 10 x 11 x 19 |

P-28

## The New Bailey Control Drive gives you THIS—




## instead of THIS

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CLEVELAND 10, OHIO

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BAILEY METERS

*Controls for*

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FEED WATER
TEMPERATURE
PRESSURE
LIQUID LEVEL
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FILL OUT AND MAIL

☐ I am interested in Bailey Control Drives. Mail me Spec. CA040.

☐ I am interested in Bailey Control Linkage. Mail me Spec. CA942B.

Name_____

Title & Company_____

Street & Number_____

City & Zone_____ State_____

# NOW in NEENAH!

**A NEW STOWE-WOODWARD PLANT**
**with COMPLETE FACILITIES for the manufacture of RUBBER COVERED ROLLS for PAPERMAKING**

Neenah, Wisconsin, strategically located with respect to the great papermaking industries of the Midwest, is the home of Stowe-Woodward's newest rubber roll covering plant. Installation of complete equipment for the production of the Stowe-Woodward rolls so widely employed in papermaking is completed.

The opening of Stowe-Woodward's Neenah plant is the first step in a carefully planned program of expansion designed to bring Stowe-Woodward service closer to papermakers. Construction now under way will soon add another Stowe-Woodward plant in Griffin, Georgia. Both of these new plants are a reflection of the confidence of America's papermakers in Stowe-Woodward's

*"Rubber Covered Rolls with a Reputation."*

S-W INC.

**STOWE-WOODWARD, Inc.**

*Craftsmen in rubber*

**NEENAH, WISCONSIN - NEWTON 64, MASS. - GRIFFIN, GEORGIA**

*New York Office: WOOLWORTH BUILDING New York 7, N.Y.*
*On the West Coast: HUNTINGTON RUBBER MILLS, Inc., Seattle*

**FLEXIBILITY** of G-E drive on St. Regis' new paper machine helps provide high-quality output, and aids production through precise, dependable operation.

**St. Regis' new 230-in. Beloit, powered by G-E sectional drive, produces . . .**

# 300 tons of paper per day

Since 1945, demand for kraft paper has skyrocketed. Bidding for a bigger share of the expanding market, the St. Regis Paper Co. is depending on this giant Beloit fourdrinier machine located at their new, full-integrated mill at Jacksonville, Fla. Already, it has produced over 100,000 tons of kraft.

In operation only a year, the new machine has shown its versatility by turning out everything from 24-pound paper to 24-point board, to a wide variety of specifications. Operating speeds have exceeded 1900 feet per minute.

**Modern drive system**—Paper machine flexibility makes top-speed output like this possible at the Jacksonville plant. It is also the reason why paper and board uniformity and quality can be kept high, even with broad product diversification.

To provide the machine flexibility they needed, St. Regis had a modern General Electric multiple-generator sectional drive installed on their fourdrinier machine. With this electronically controlled system, machine operators can hold paper speeds and tensions precisely over a wide range of settings—and turn out a high rate of top-quality production, with minimum downtime.

**Electrically co-ordinated**—This machine is part of a completely integrated mill. The electrical system was engineered as a unit, from wood-yard to finishing room by a team of G-E specialists working with the customers' staff and consulting engineers.

The next two pages show you a picture-story of what they did.

***How G-E engineering teamwork helped plan a better mill***

**GENERAL ELECTRIC**

# Here's how G-E engineering services saved time, work and money for St. Regis

**Co-ordinated manufacture and installation of G-E equipment helped St. Regis build one of the country's most modern mills.**

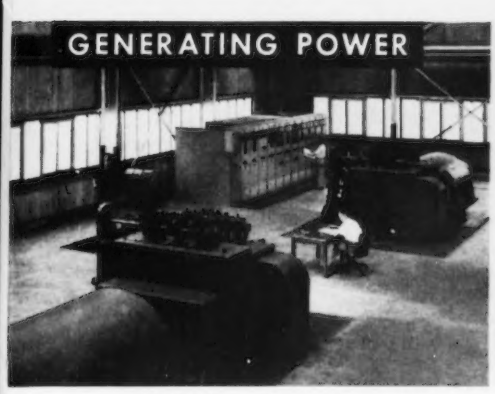
**Co-ordination** made a success out of the electrical system at St. Regis' new kraft mill at Jacksonville. It simplified the earliest conferences, smoothed out equipment planning and installation, helped meet start-up dates. Through co-ordination, a team of General Electric engineering specialists were able to help St. Regis and the consulting engineers design the entire mill's electrical system as a unit. It was a big job—but it saved time, money, and engineering man-hours for St. Regis.

G-E Power Engineer
W. C. Bloomquist

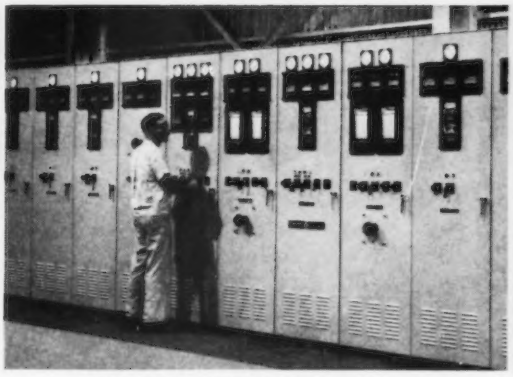
**Engineering help started early**—Sales and application engineers on the G-E team were asked, in the planning stage, to make recommendations for the entire system. They conferred with St. Regis plant engineers, and later, worked closely with their consultants, Alvin H. Johnson & Co. Engineers, and with representatives from prime contractor.

**G-E "team" follows through**—The rest of the G-E engineering team was called into action. The project co-ordinator at Schenectady, N. Y., responsible for engineering, production, and shipment co-ordination, scheduled the construction and shipping dates of all apparatus. G-E product specialists helped work out the detailed designs needed for special equipment. Because of this, St.

G-E Application Engineer
G. E. Shaad

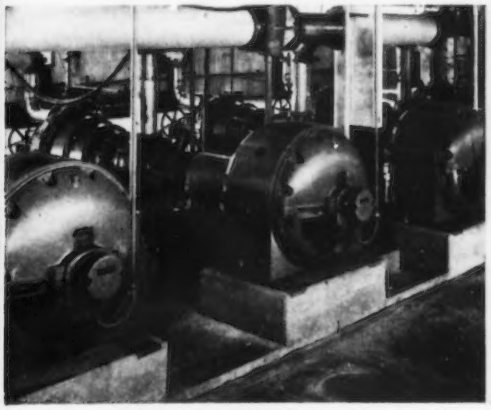



**1** **POWER** for entire mill is generated by two 6000-kw G-E turbine-generators from available process steam.



**2** **FACTORY ASSEMBLY** of this turbine room 4160-V G-E switchgear helped cut installation costs.

**3** **RUGGED** G-E motors drive two 45-ft. barking drums helping to keep raw material movement high.



**7** **HIGH EFFICIENCY** at low cost is provided by G-E 400-hp synchronous motors powering Jordans.

**8** **FLEXIBLE** sectional drive for paper machine is all G-E powered, helps assure greater production continuity.

**9** **CONVENIENT, COMPACT** G-E control for wet end of 230-in. paper machine is located in one room.

Regis engineers and the consultants were relieved of a great deal of time-consuming correspondence and details, allowing them more time for the larger aspects of the project. Orders went out from Schenectady to key G-E plants throughout the country—to Fort Wayne, Indiana; to Pittsfield and West Lynn in Massachusetts; to Philadelphia and San Jose, Calif.

Co-ordination was just as vital during equipment construction as it was during first planning. It paid off the same way. For instance, the construction of operator's control panels for the paper machine was carried out in Wisconsin near the machine builder to assure integrated control of the machine.

**Start-up aided by co-ordinated service**—Deliveries to Jacksonville were rigidly scheduled. Equipment arrived on site at St. Regis when needed for actual construction. Progress reports, issued at frequent intervals by the G-E team, kept St. Regis' receiving, operating, accounting and expediting personnel up to date.

G-E Sales Engineers (l. to r.) D. F. Richardson, R. E. Griggs and H. L. Smith

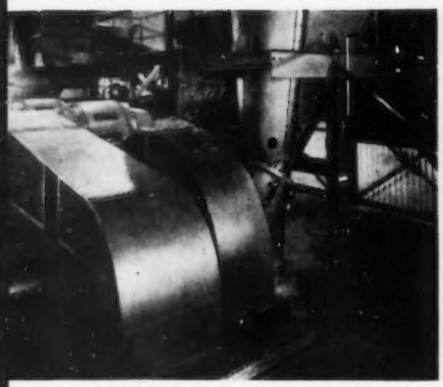
On hand during equipment installation, G-E field engineers were able to simplify the job of getting the new mill into production. They passed operating and maintenance information on to plant personnel. And at start-up time, their services helped St. Regis go into full-scale operation. The new Jacksonville mill made its first sheet of paper December 31, 1952. The dependable G-E electrical system, controlling 25,985 horsepower, has been giving St. Regis top performance ever since. 655-15

**YOU CAN GET THE SAME HELP**

**Your job of getting a new or a modernized mill completed on time can be simplified. Call in your local G-E Sales Representatives early in your plans. Let him give you the complete story on the way a G-E Apparatus Sales Division team can work with your plant and consulting engineers to expedite your new project. General Electric Company, Schenectady 5, N.Y.**

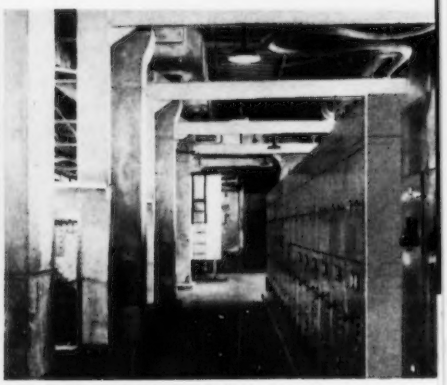
## Engineered Electrical Systems for Paper Mills

# GENERAL ELECTRIC

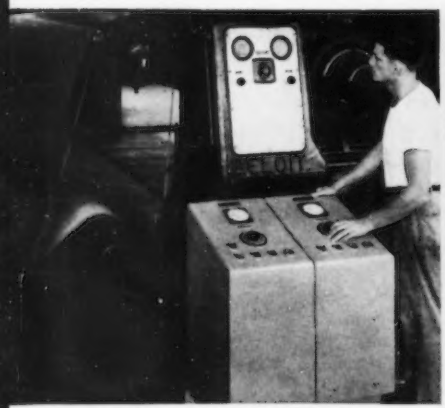


**4** **RELIABLE** G-E motors driving 88-in. 10-knife chippers help reduce logs to 5/8 in. chips quickly.

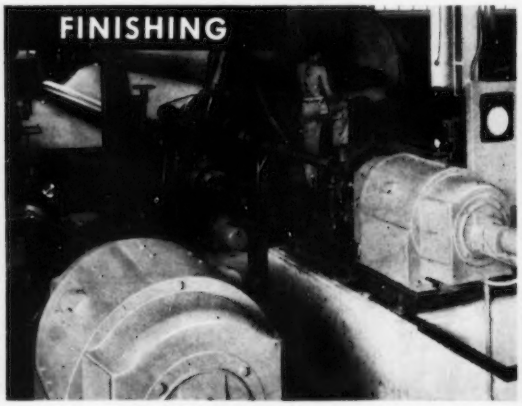
**5** **CONSTANT STOCK FLOW** is responsibility of G-E pump motors located below paper machine room.



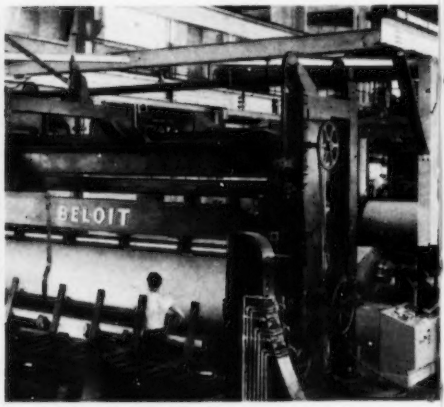
**6** **FOR MORE ROOM** in work area, G-E limitamp control is located out of the way on this balcony.



**10** **PRECISE CONTROL** from G-E operator's console means increased output of quality kraft at St. Regis mill.

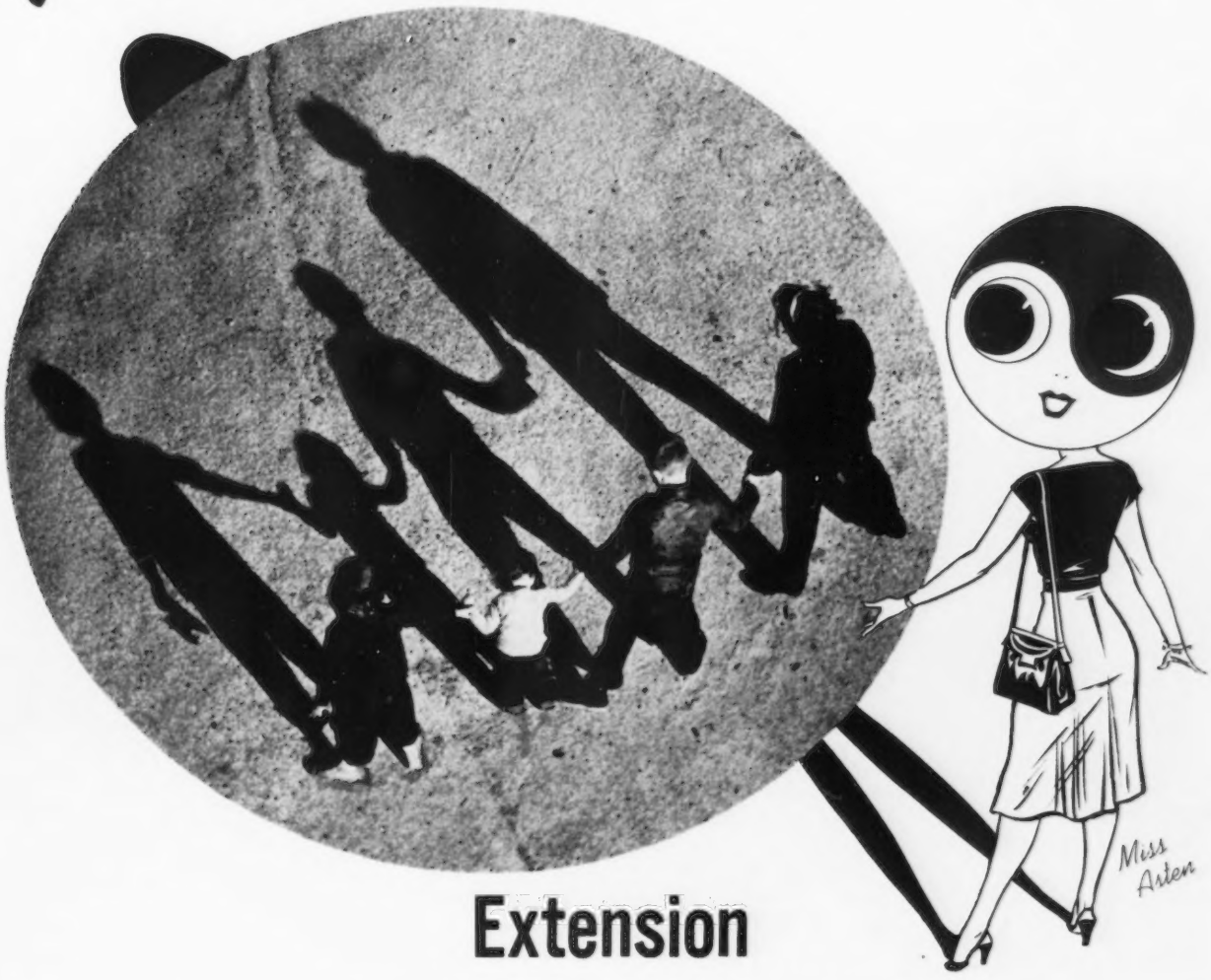



**11** **EASY THREADING,** higher winding speeds are possible with G-E motors and amplidyne control.




**12** **FAST ACCELERATION,** deceleration provided by G-E motor helps increase slitter and rewinder output.

# Asten DRYER FELTS




## Extension

To many mill operators, the extended service of ASTENS
is a source of wonderment; to *all* who use them,
they bring lasting satisfaction.

***Economy in the long run***

**ASTEN-HILL MFG. CO.**
PHILADELPHIA, PENNA.

**ASTEN-HILL LIMITED**
VALLEYFIELD, QUEBEC

# Million-Pound C-E Recovery Unit begins service at Longview Fibre Company

A major addition to Longview Fibre Company's continuing expansion program — its second C-E Recovery Unit and one of the world's largest—began operation in November 1953.

Housed in a seven-story-high building, the new unit is designed to burn 1,050,000 pounds of black liquor solids per day, and to produce 165,000 pounds of steam per hour at 850 psi and 750 F.

The availability of this new equipment made it possible to effect urgently needed repairs on the stack that served other recovery units of the mill. The new unit was called upon to operate at well above its rated capacity during this period. This it did with complete satisfaction carrying the load of five of the six paper machines.

In reordering C-E recovery equipment the Longview Fibre Company but adds its name to the growing list of companies which have done so. So far, fourteen leading pulp and paper manufacturers have ordered a C-E Recovery Unit at least twice, two of them on three occasions and three companies have ordered four times. This record, we believe, speaks for itself. B-730

C-E

**COMBUSTION ENGINEERING, Inc.**

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

BOILERS FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

for maximum process stability and economy
now nondusting
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• Excellent light fastness
• Quick wetting-out
• Uniform dispersion

Solar Colors are now being delivered in a new nondusting, noncaking form which completely eliminates handling difficulties.

Solar Blues and Violets are available in a full range of shades which will produce tints of any possible hue for the brightest whites or coated papers with unexcelled color *performance*.

All these advantages are available at no extra cost.

Write for samples and technical information on the role of Solar Colors for tinting white papers.

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Anticipating industry's every need, the Wausau Paper Mills produced their new, complete line of IMPRESSION PAPERS to fit your particular jobs, whether you use stencil, lithograph or spirit process.

Wausau Bond, Wausau Mimeo and Wausau Duplicator are watermarked—each especially prepared for clean, sharp, easy-to-read impressions. Exact Bond, Exact Mimeo and Exact Duplicator are full-bodied economy papers, unwatermarked, made rigid for high speed operation.

*Artisans of Fine Papers*

The complete line is available nationally through authorized distributors and stationers.

**WAUSAU PAPER MILLS CO.**

*Executive Sales Offices*

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**WAUSAU**

Artisans of Fine Papers

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Artisans of Fine Filler Clays

When industry seeks clean, sharp, easy-to-read impressions—whether on bond, mimeo, or duplicator paper—they can find no more qualified "Artisans of Fine Papers" than Wausau Paper Mills Company. Wausau has fine-impression papers to fit every business need. And helping Wausau put "full body" into their economy papers, and helping towards smoother production are J. M. Huber filler clays.

Huber filler clays go far towards making printing papers brighter, smoother, and of finer texture. Huber filler clays help increase the opacity of the highest-quality papers.

25 years of experience in clay mining and production lie behind Huber Clays. Thirteen vital laboratory tests★—from crude to finished clay—guarantee product uniformity from bag to bag, carload to carload.

If you want your paper to deliver maximum performance, specify Huber Clays. Write today for your free working sample.

**HUBER**

## ONE OF THE WORLD'S LARGEST CLAY PRODUCERS

MINES & PLANTS: LANGLEY, S. C., GRANITEVILLE, S. C., AND HUBER, GA.

J. M. HUBER CORPORATION, 100 PARK AVENUE, NEW YORK 17, N. Y.

### Quality Clays for the Paper Industry

**HI-WHITE**—low cost airfloated filler clay, mined in Georgia, of high brightness, fine particle size, minimum abrasion. Tested regularly each half-hour during production.

**PARAGON**—produced in South Carolina, this low cost airfloated filler has a slightly larger particle size than Hi-White, its Georgia counterpart. Refined to the same close specifications with respect to abrasion and uniformity.

**WWF**—a Georgia water-washed filler of high, dependable brightness. Available in lump form for use where this type is preferred over the fluffier airfloated fillers. Also available pulverized.

**CWF**—a Georgia water-washed filler of same general type as WWF but with a slightly coarser particle size distribution which in some mills permits higher solids slurrying. Lump or pulverized.

**HYDRATEX**—a Georgia coating grade of medium particle size distribution and priced accordingly. Quality controlled throughout. Lump or pulverized.

**SPECIAL HYDRATEX**—a Georgia coating grade of fine particle size, with excellent covering power and flow characteristics ideally suited to certain coating methods. Lump or pulverized.

**X-43**—a fine particle Georgia coating clay of low viscosity and high brightness particularly well adapted to high solids coating. Lump or pulverized.

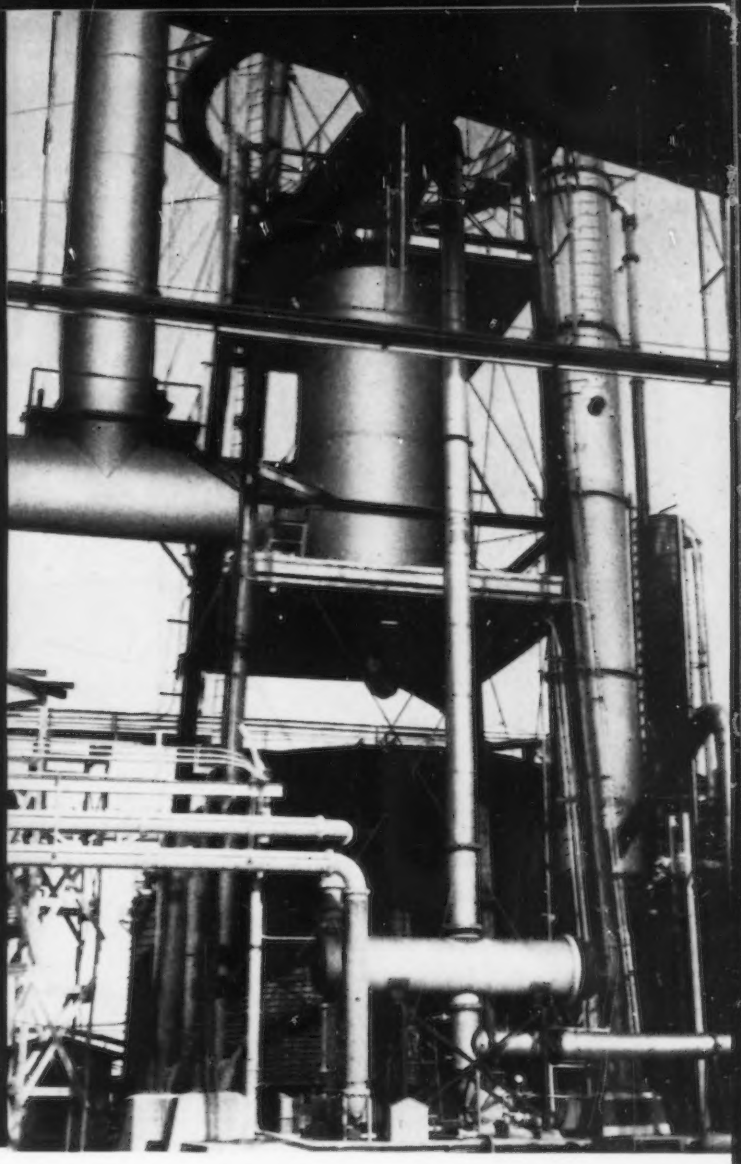
**X-44**—a low viscosity Georgia coating grade containing a minimum of soluble salts; excellent for color pigmentation. Lump or pulverized.

**HYDRASPERSE**—a drum-dried, low viscosity, high brightness, fine particle, Georgia coating grade, in flake form, with the dispersant already added. Saves "make down" time and assures thorough dispersion in practically any equipment.

| ★ Lab tests for: | | |
|---|---|---|
| 1. Brightness | 5. Screen Residue | 9. Dispersion |
| 2. Viscosity | 6. Adhesive Demand | 10. Soluble Salts |
| 3. Particle Size | 7. Gloss | 11. Abrasion |
| 4. pH | 8. Opacity | 12. Moisture |
| | | 13. Suspension |

# this single VULCAN ENGINEERED unit

## removes atmospheric contamination, recovers $SO_2$ for re-use and permits increased plant capacity



Vulcan Engineering recently completed this sulfur recovery unit for Rayonier's huge plant at Fernandina Beach, Florida. The result—two immediate, practical, dollar-saving advantages:

First: *prompt removal of atmospheric contamination;*

Second: *recovered sulfur dioxide for re-use in the acid making system.*

Thus, with this Vulcan-engineered unit Rayonier simultaneously resolves the problem of digester blow vapors *and* realizes substantial savings in sulfur consumption. In addition, the recovered sulfur permits increased plant capacity without the necessity of enlarging the acid making system.

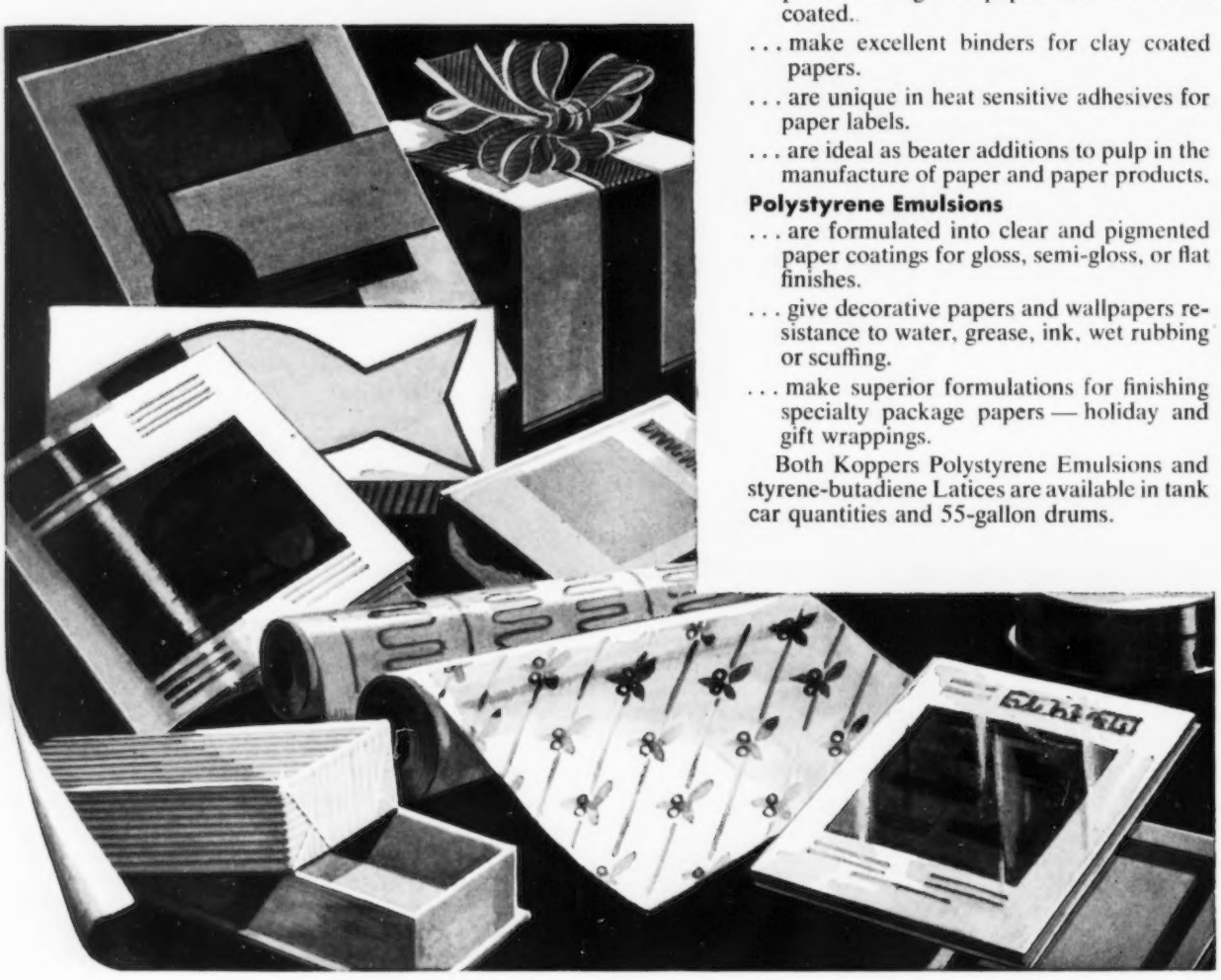
Engineers and cost-conscious mill executives will be interested in the efficient control instrumentation designed by Vulcan engineers to simplify the extreme complexities in rapidly varying process conditions. A special point of interest, too, is that facilities are built into this unit for the subsequent addition of heat recovery equipment whenever desired.

If your mill is considering an attack on its digester blow problem, don't overlook the numerous special advantages which a Vulcan-designed sulfur recovery unit can effect for you. As at Fernandina Beach, Vulcan can provide your mill with a complete unit, *designed to fit your particular operating conditions.*

# VULCAN ENGINEERING DIVISION

# For Better, longer-lasting paper

## use KOPPERS LATICES



• **Koppers Latices** are stable water dispersions effectively used in the paper making field.

**Styrene-Butadiene Latices**

. . . have wide range of styrene-butadiene ratios from 50-50 to 90-10 to fit your particular application.

. . . feature high solids content, low viscosity, and ultrafine particle size that insures complete coverage of paper surfaces to be coated.

. . . make excellent binders for clay coated papers.

. . . are unique in heat sensitive adhesives for paper labels.

. . . are ideal as beater additions to pulp in the manufacture of paper and paper products.

**Polystyrene Emulsions**

. . . are formulated into clear and pigmented paper coatings for gloss, semi-gloss, or flat finishes.

. . . give decorative papers and wallpapers resistance to water, grease, ink, wet rubbing or scuffing.

. . . make superior formulations for finishing specialty package papers — holiday and gift wrappings.

Both Koppers Polystyrene Emulsions and styrene-butadiene Latices are available in tank car quantities and 55-gallon drums.

*Besides Latices, Koppers produces many additional synthetic chemicals, including Resorcinol, Styrene Monomer, Di-tert-butyl-paracresol, Polystyrene, Phthalic Anhydride and Divinylbenzene.*

**KOPPERS COMPANY, INC.**

**Chemical Division, Dept. PTJ-574, Pittsburgh 19, Pennsylvania**

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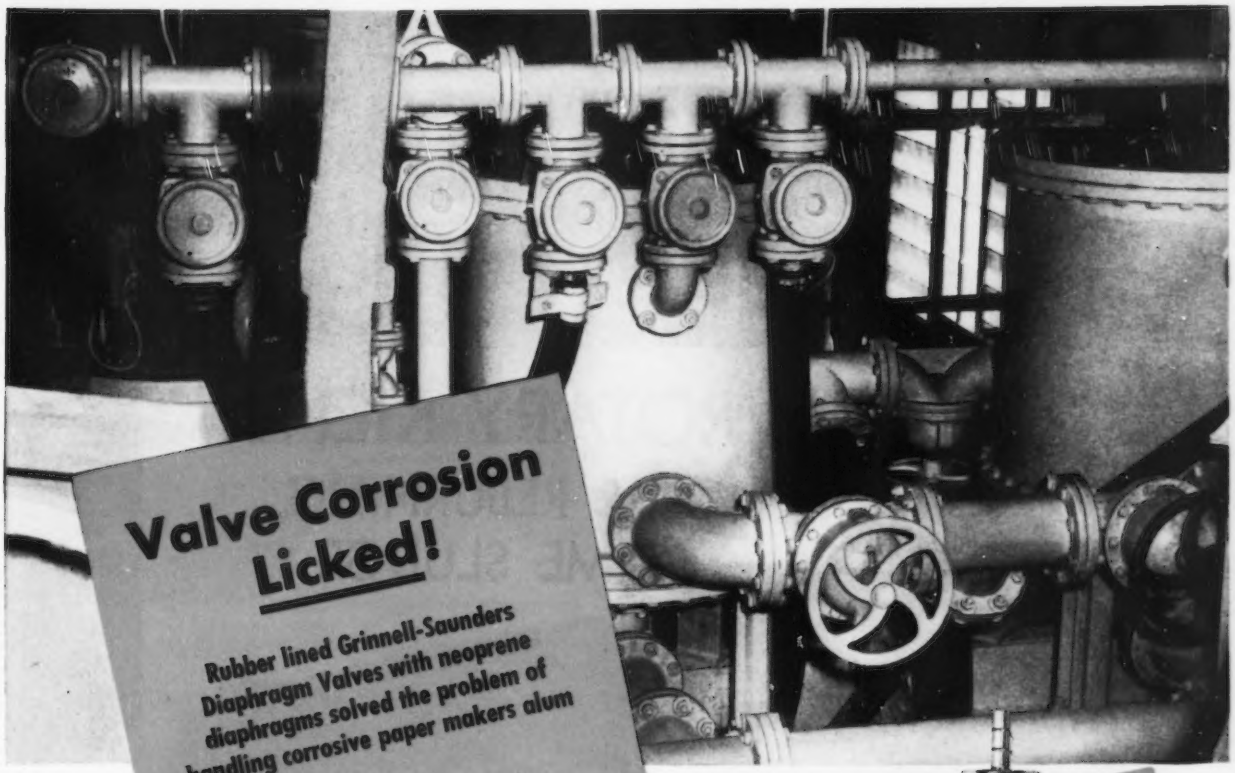

Valve Corrosion Licked!
Rubber lined Grinnell-Saunders Diaphragm Valves with neoprene diaphragms solved the problem of handling corrosive paper makers alum

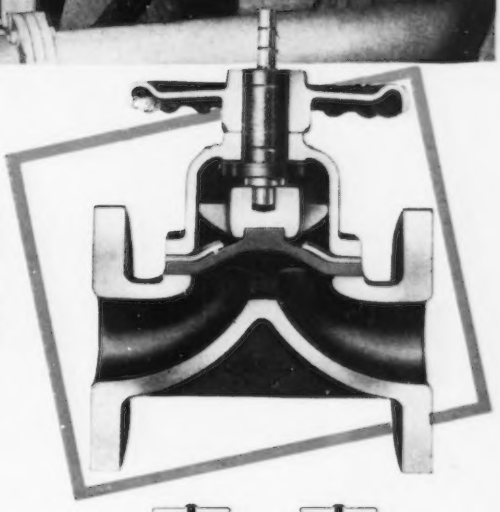
# GRINNELL-SAUNDERS DIAPHRAGM VALVES

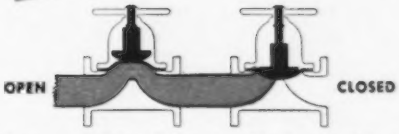
Commercial aluminum sulphate *can be everlastingly troublesome,* as anyone knows who has ever had to work with it. So, comparing notes with a company that handles this chemical every day of its business life may be helpful.

Northern Chemical Industries, Searsport, Me., is an important manufacturer of "paper makers alum". Northern Chemical Industries relies heavily on Grinnell-Saunders Diaphragm Valves. They have found that the wide range of body, lining and diaphragm materials available with Grinnell-Saunders valves offers flexibility in handling a wide variety of corrosive fluids.

The basic design of the valve is an advantage. Working parts are completely isolated from the fluid stream which, in the case of corrosive acids, means longer valve life. Also, there is the matter of economy. With Grinnell-Saunders Diaphragm Valves, it is usually possible to go to less expensive body materials, to which special body linings can be added. Replacement and maintenance expenses, moreover, are greatly reduced.

Originally designed and ideally suited for air and water service, Grinnell-Saunders Diaphragm Valves also are recommended for almost every regular or special service. This is backed up by the excellent performance records achieved by valves now in use.






***Features of Grinnell-Saunders Diaphragm Valve:***

- Diaphragm absolutely isolates working parts from fluid
- Diaphragm lifts high for streamline flow in either direction
- Diaphragm presses tight for positive closure
- Body, lining and diaphragm materials to suit service
- Simple maintenance — diaphragm easily replaced without removing valve from line

**GRINNELL**
**WHENEVER PIPING IS INVOLVED**

**Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors**

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

# SMIDTH

## ROTARY KILNS FOR REBURNING LIME SLUDGE

The illustration above shows a modern, Smidth Rotary Kiln for reburning lime sludge at the plant of the West Virginia Pulp & Paper Co., Charleston, South Carolina.

F. L. Smidth & Co. are specialists in the design and manufacture of rotary kilns and have furnished numerous installations in many countries for burning lime, lime sludge, dolomite, magnesite, cement, ores, etc.

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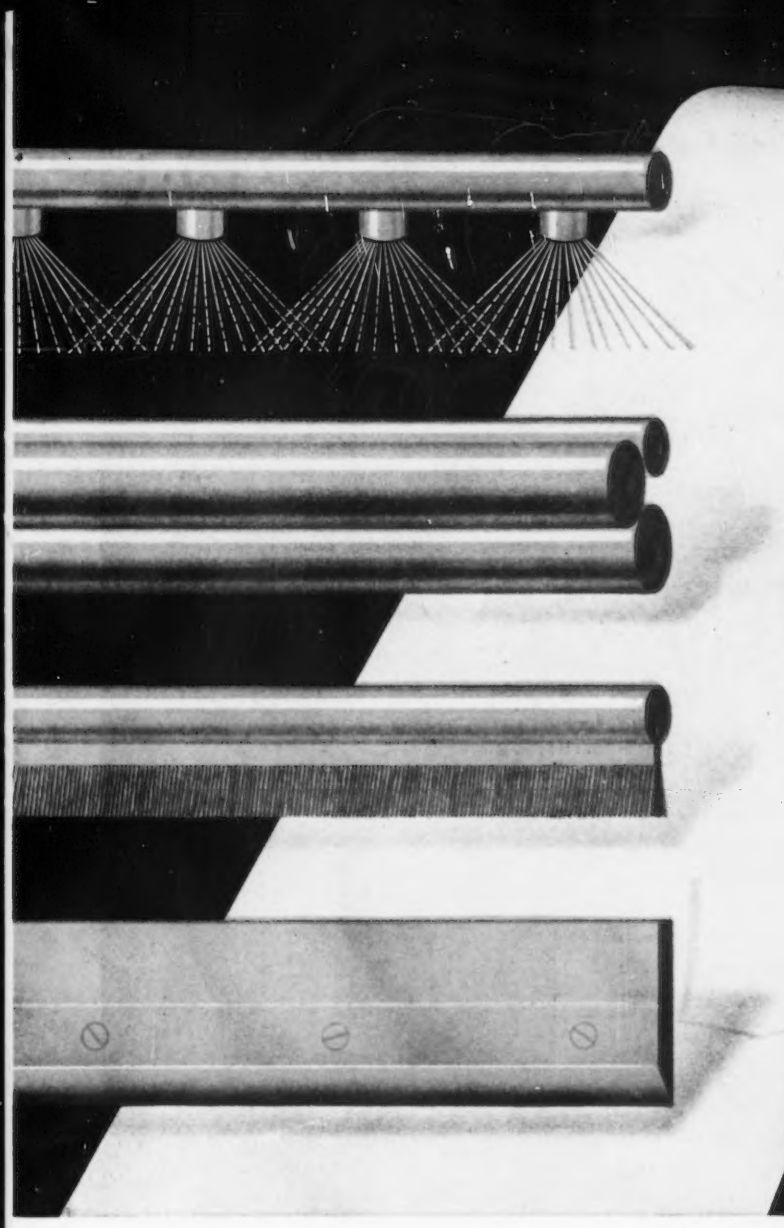
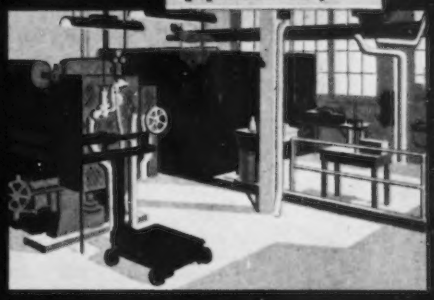


Saturating machine, part of Naugatuck's modern pilot plant equipment.

Section of Naugatuck's complete new paper laboratory.



# The finest finishes start with Kralac

**For the superior finish that sells** paper products, you'll find there are few products to equal Naugatuck Chemical's Kralac®.

**The world's leader in the field of natural and synthetic latices** for 30 years, Naugatuck has developed a series of plastic latices that offer paper manufacturers just about **every** conceivable advantage.

**Naugatuck's Kralac provides—**

- excellent smoothness, gloss, and opacity.
- improved flexibility, tear, tensile and fold strength.
- outstanding wet strength and wet rub resistance.
- unusual mechanical and dimensional stability.
- superior printability, with standard inks and presses.

What's more, inexpensive Kralac latices can be applied with spray, brush, roll, or air-knife coaters, at speeds from 150 to 700 feet per minute. They are compatible with most other coating compounds and can be used in varying proportions to provide the **exact** qualities your paper product demands.

If you're not already enjoying the superior performance of Naugatuck's Kralac in **your** paper manufacturing, you'll find it worth your while to send the coupon below. We'll be glad to supply you with further technical information, as well as expert technical assistance with your particular coating problem.

**Naugatuck Chemical**

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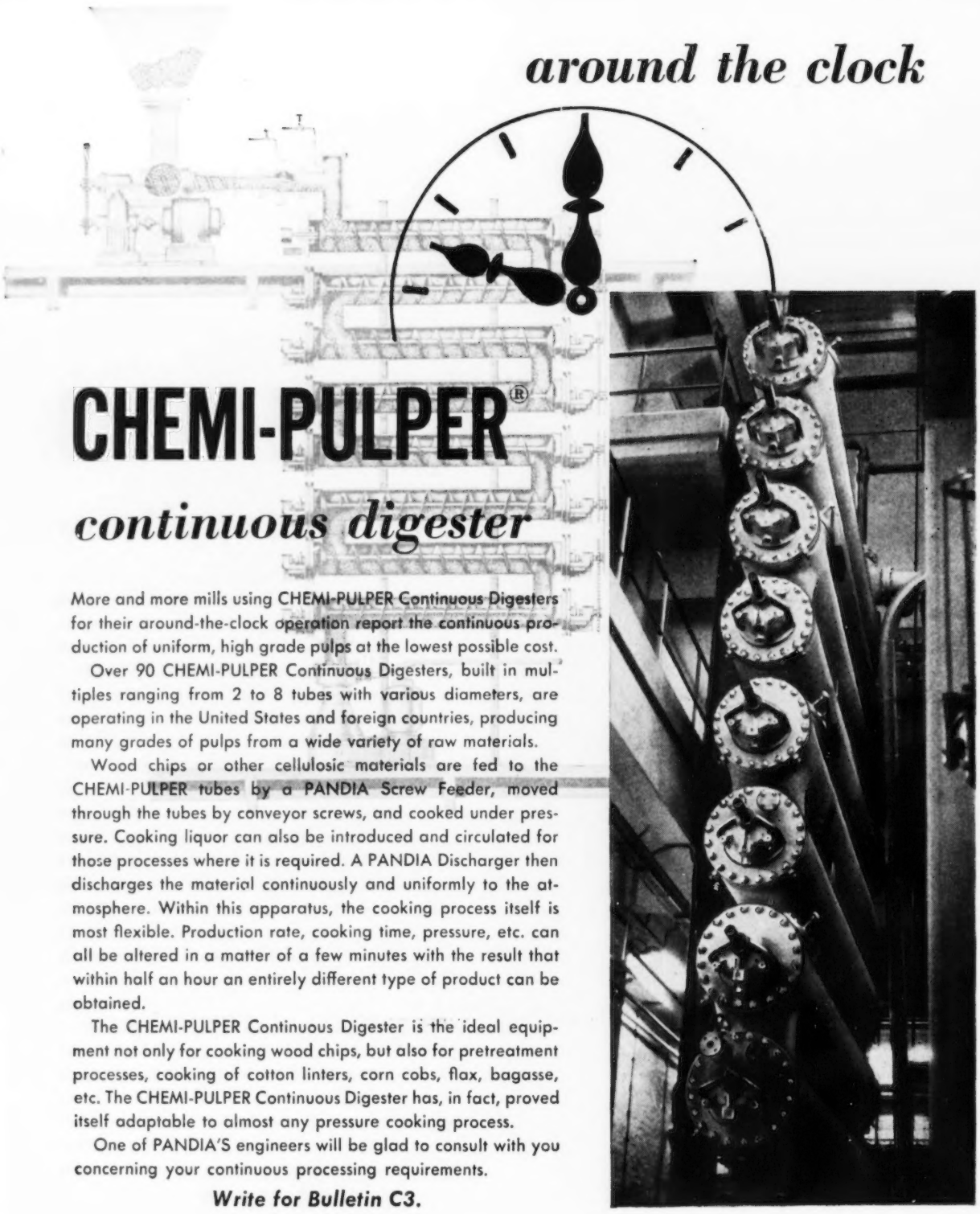

# CHEMI-PULPER®

## *continuous digester*

More and more mills using CHEMI-PULPER Continuous Digesters for their around-the-clock operation report the continuous production of uniform, high grade pulps at the lowest possible cost.

Over 90 CHEMI-PULPER Continuous Digesters, built in multiples ranging from 2 to 8 tubes with various diameters, are operating in the United States and foreign countries, producing many grades of pulps from a wide variety of raw materials.

Wood chips or other cellulosic materials are fed to the CHEMI-PULPER tubes by a PANDIA Screw Feeder, moved through the tubes by conveyor screws, and cooked under pressure. Cooking liquor can also be introduced and circulated for those processes where it is required. A PANDIA Discharger then discharges the material continuously and uniformly to the atmosphere. Within this apparatus, the cooking process itself is most flexible. Production rate, cooking time, pressure, etc. can all be altered in a matter of a few minutes with the result that within half an hour an entirely different type of product can be obtained.

The CHEMI-PULPER Continuous Digester is the ideal equipment not only for cooking wood chips, but also for pretreatment processes, cooking of cotton linters, corn cobs, flax, bagasse, etc. The CHEMI-PULPER Continuous Digester has, in fact, proved itself adaptable to almost any pressure cooking process.

One of PANDIA'S engineers will be glad to consult with you concerning your continuous processing requirements.

***Write for Bulletin C3.***

*Manufactured and Sold in Canada by*
**THE ALEXANDER FLECK LIMITED, OTTAWA, CANADA.**

**PANDIA**

**PANDIA INC.**

122 EAST 42nd STREET • NEW YORK 17, N. Y.

# Farrel rolls at work in "The Kraft Center"

St. Regis Paper Company's big kraft operation at Pensacola, Florida, is known as "The Kraft Center." Two mills, complete from pulp-making facilities to fourdriniers, and a large multiwall paper bag plant, inspired the name.

Shown above are two Bagley & Sewall calenders, each equipped with eight precision-ground Farrel rolls. Here at "The Kraft Center," as in most leading paper mills, calender rolls from *roll headquarters* at Ansonia are at work contributing to uniform quality production.

The durability and resistance to abrasion of Farrel rolls—the result of a perfect combination of metal formula and depth of chill—make them the most popular rolls in the industry and the logical choice for your calenders.

For further information, send for a free copy of Bulletin No. 116.

**FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.**

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*Farrel-Birmingham*®

FB-906

# CALGON LEADS
## in coating formulas

## 2 out of 3

of the nation's leading producers of coated papers choose Calgon for their coating formulas

No wonder so many top producers of coated papers use Calgon in their coating colors. Its superior deflocculating properties has established Calgon as first choice wherever high quality and greater efficiency are wanted. Calgon leads because it provides . . .

**BETTER PIGMENT DISPERSION.** Calgon's efficiency as a dispersive of clay, titanium dioxide, precipitated calcium carbonate and other pigments result in better finished coated stock.

**BETTER COATING COLORS.** Coating colors are superior when Calgon is used because of improved flow properties and because higher solids can be used.

**BETTER SURFACE COATINGS.** Calgon in the formula greatly improves the bond between the coating and the paper stock.

Calgon can help in many other ways. If you have a specific problem, Calgon Technical Service stands ready to assist you in finding a solution. Tell us about your problem, or write for a copy of "Calgon and its Applications in the Pulp and Paper Industry."

HAGAN HALL BUROMIN CALGON

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A SUBSIDIARY OF HAGAN CORPORATION
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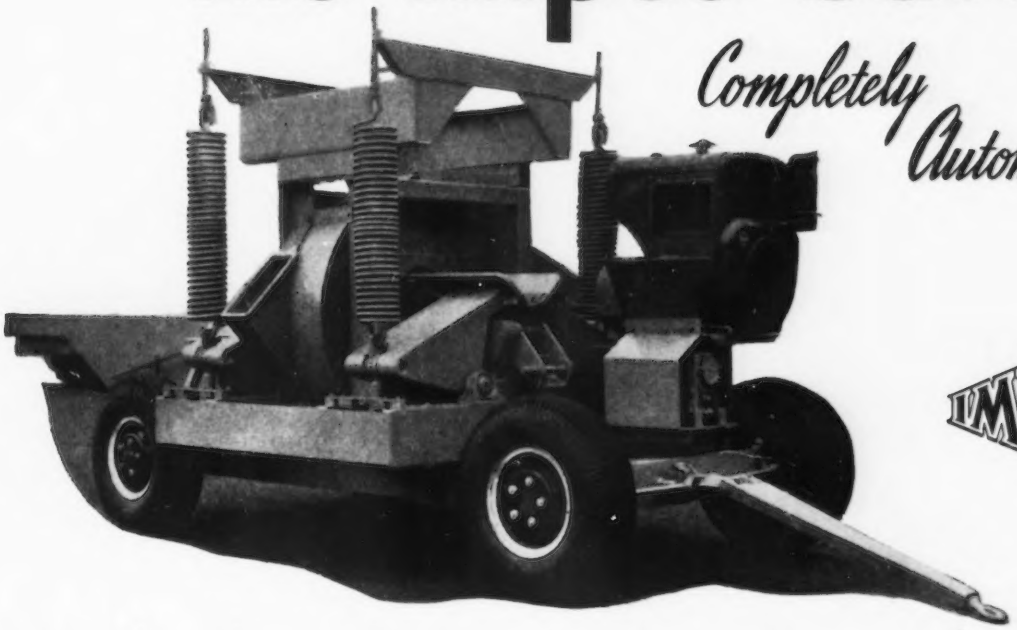
*T.M. Reg. U.S. Pat. Off.

*Introducing*

# the Impco barker

*Completely Automatic*



IMPCO

## *Easily handles irregular shaped logs!*

The Impco Barker has been developed to meet today's high bark removal requirements combined with low wood loss.

It is available as a stationary unit for general wood yard barking or as a portable unit mounted on a heavy frame equipped with tires for highway towing. The mobile unit can be furnished with a self-propelling drive for moves between barking sites.

Capacities up to 20 cords per hour depending on conditions, size and type of wood can be expected.

*Specifications:*

Wood size — 4' to 8' in length
4" to 18" in diameter

Feed Rate — 30 to 120 f.p.m.

Infeed and Outfeed Conveyors — Automatic, self-centering, self-sizing

Barking Tools — 6 springloaded — automatic sizing for variable log diameters

Bark Discharge — Mechanical ejection

Drives — Gasoline or electric powered

**IMPROVED MACHINERY INC.**
**NASHUA, NEW HAMPSHIRE**

*Sherbrooke Machineries Limited, Sherbrooke, Quebec manufacture similar equipment in Canada*

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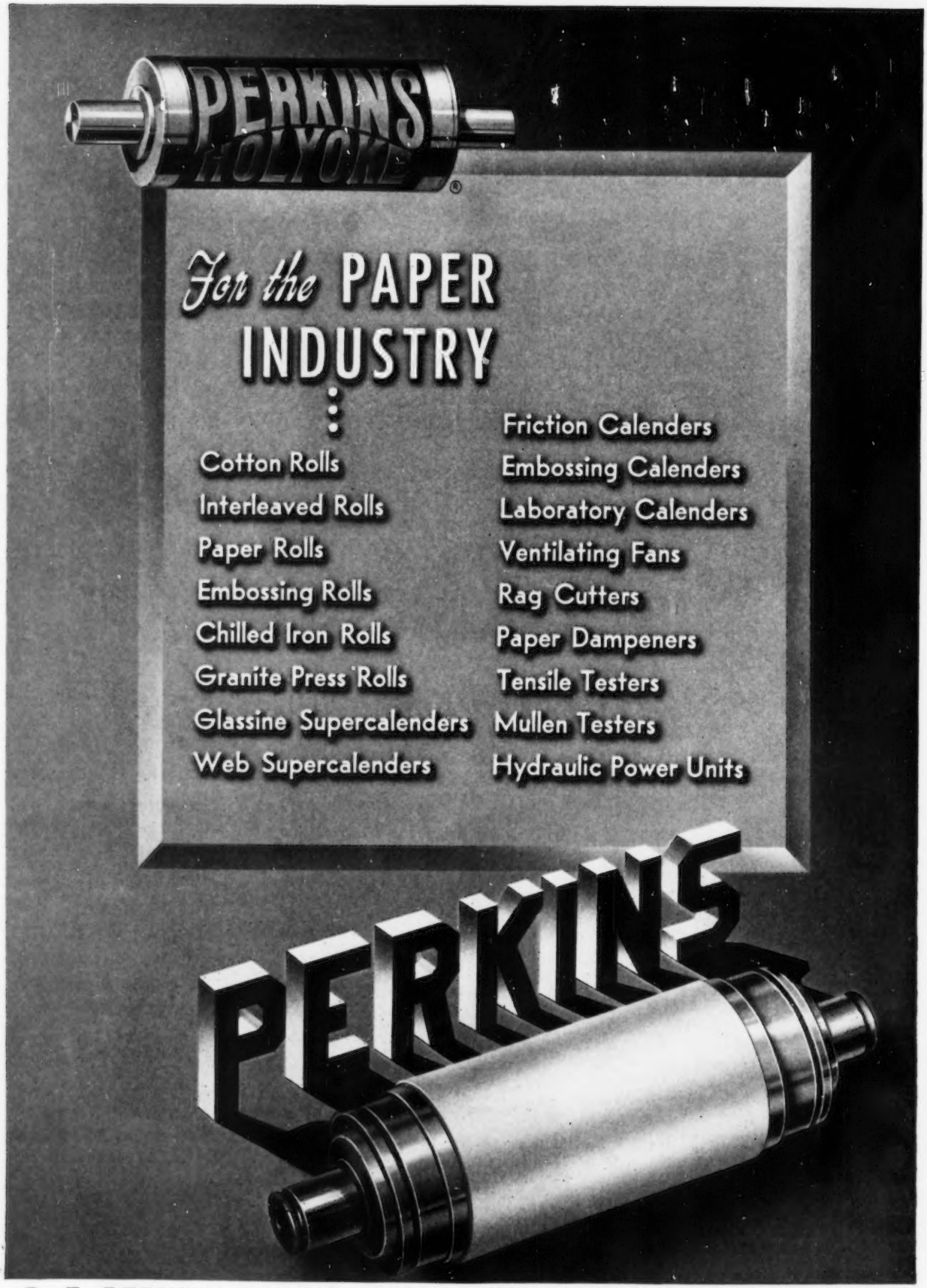
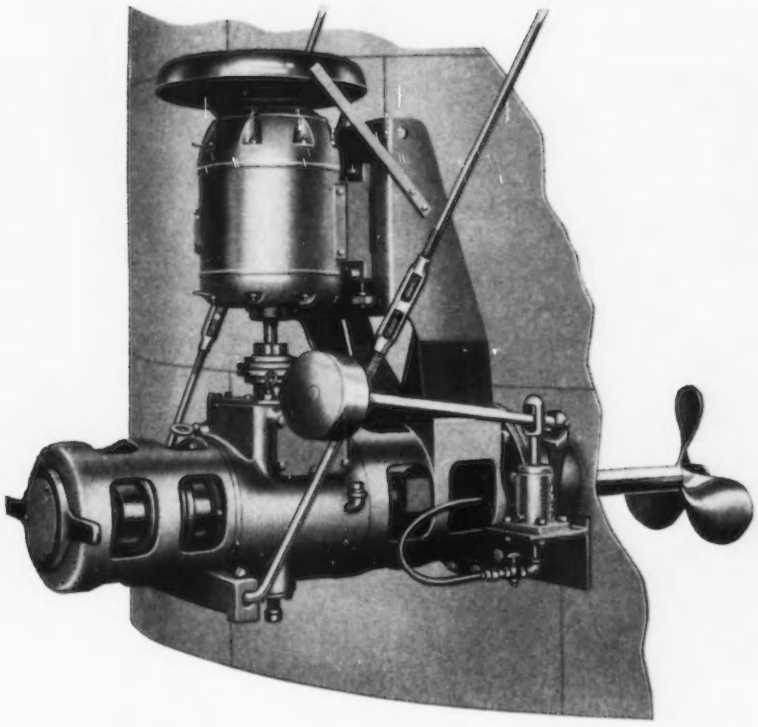
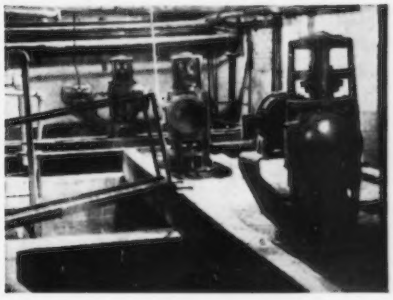



B. F. PERKINS & SON, INC. • HOLYOKE, MASSACHUSETTS



**NEW LOW** in maintenance cost. No shutdowns—ever—to repack this side entering LIGHTNIN Mixer. You can shut off the stuffing box from the tank, for repacking, as simply as turning a valve. Or you can specify the new LIGHTNIN replaceable rotary mechanical seal—and eliminate all repacking *forever!*

**NEW WAY** to keep stock uniform. Produce 6% stock in a vertical unbaffled chest, and hold it at uniform consistency. Turbine-type LIGHTNIN Mixers for stock chests are built in sizes to 500 HP.



**NEW SPEED** in wetting-out starch, suspending coatings, mixing chemicals, with LIGHTNINs scientifically sized to fit the requirements of your process. Hundreds of standard power-speed combinations. Shipped ready to install. Fully guaranteed.

# What's *NEW* in fluid mixing

Mechanically, or process-wise—however you look at it, there are new dimensions in fluid mixing.

For example, now you can get 100% accurate prediction of most mixing results, for any size system, from one or two pilot plant runs.

This means you eliminate the risk that comes with trial-and-error mixing. And you may save up to 40% on initial mixer cost, by knowing beforehand just how much power will be needed to do the job right.

Your LIGHTNIN Mixer representative can tell you more about mixing that does what you want it to do—and keeps on saving you money year after year. His name is in your office copy of Thomas' Register. Why not check with him today?

**NEW CONVENIENCE** when you switch to LIGHTNIN Portable Mixers for preparing sizes, tint solutions, coating slurries—rapidly, uniformly, in any open tank, without baffles. Thousands in use. Thirty models, sizes ⅛ to 3 HP.

## "Lightnin® Mixers"

***GET THESE HELPFUL FACTS ON MIXING***

LIGHTNIN Catalogs contain practical data on impeller selection; sizing; best type of vessel; installation and operating hints; full description of LIGHTNIN Mixers. Yours without obligation. Check and mail coupon today.

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## LANGSTON SLITTERS AND WINDERS

Under high speed operating conditions, Langston's new gearless drive has proved to be very smooth and flexible. It is much quieter than gear drives, even at top speeds. Wherever paper is processed, Langston Slitters and Roll Winders assure dependable, trouble-free service.

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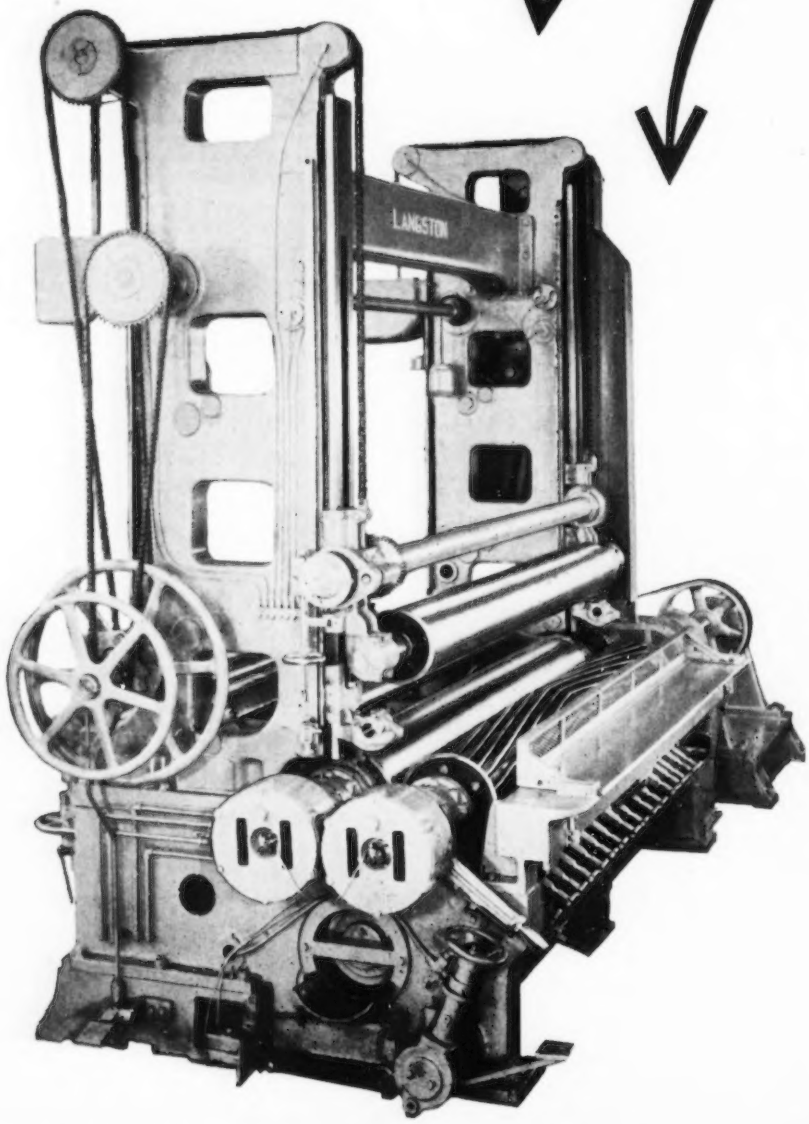
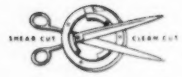


# value in a fine product

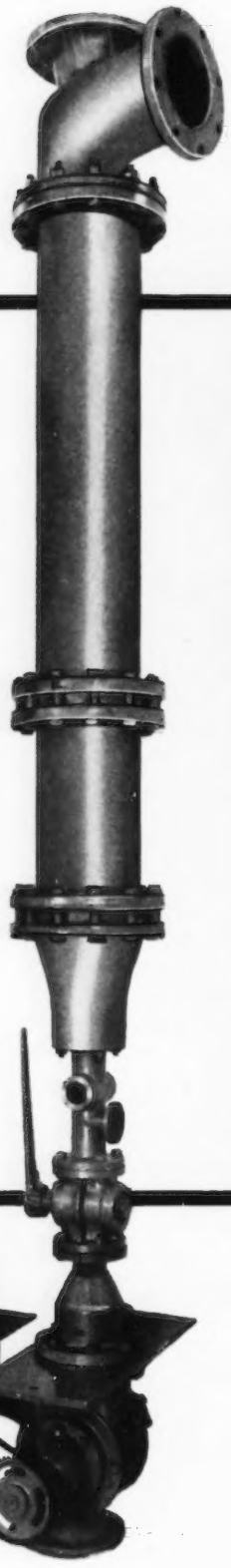
## reflects the experience and skills of its makers.

value in Fourdrinier wires is a matter of record ... paper quality and production records in mills throughout America reflect the fact that Appleton Wires are Good Wires!

APPLETON WIRE WORKS, INC., APPLETON, WISCONSIN

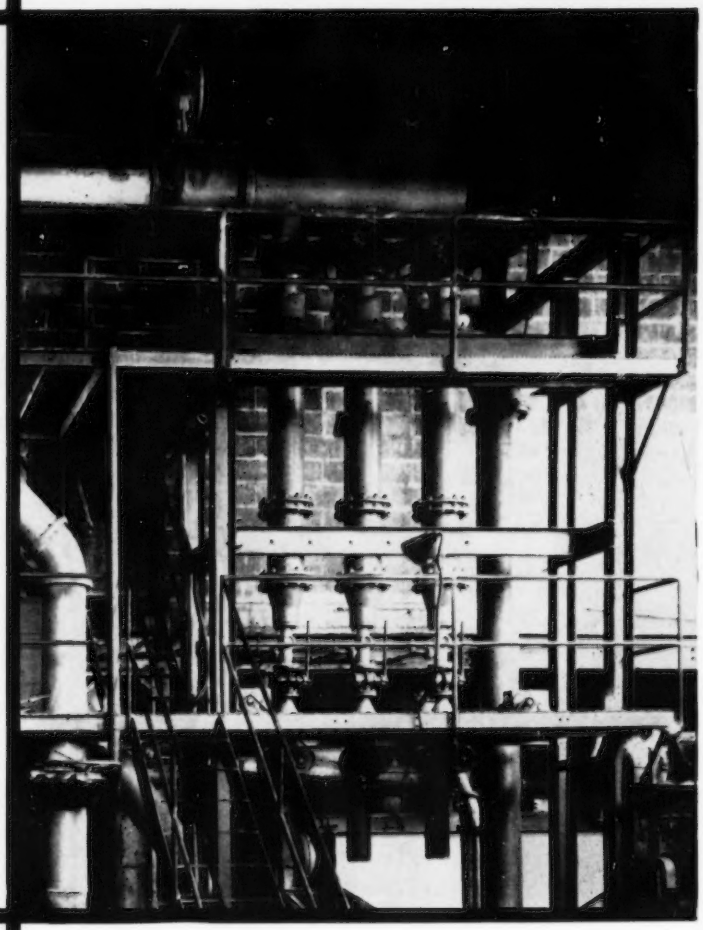
# problem:
# dirty Filler Stocks
# solution:

## VORTRAPS



Vortrap Check Points:

- ✓ Low inlet pressure—15 IPS
- ✓ Capacity 10″ Vortrap approximately 50 tons per day.
- ✓ Low maintenance.
- ✓ Fibre losses ½ to 1½ # per ton.
- ✓ Automatic rejects handling.
- ✓ Available 6″, 8″, 10″ sizes.



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And no wonder! For The William Powell Company makes more kinds of valves and has probably solved more valve problems than any other organization in the world.

Wherever flow requires dependable control, there's the place for Powell Valves—famous for dependability since 1846. Made ⅛" to 30" and 125 pounds to 2500 pounds W. S. P. Bronze, iron, steel and corrosion resistant alloys. Available through distributors in principal cities. On problems, write direct to The Wm. Powell Company, Cincinnati 22, Ohio.

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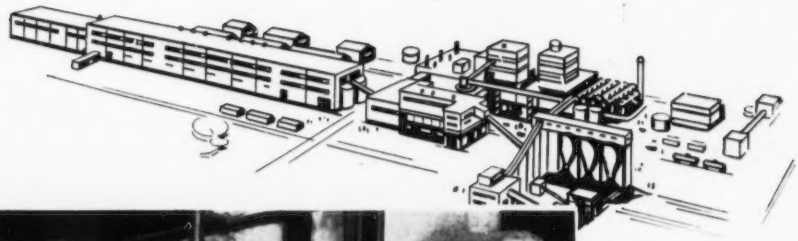
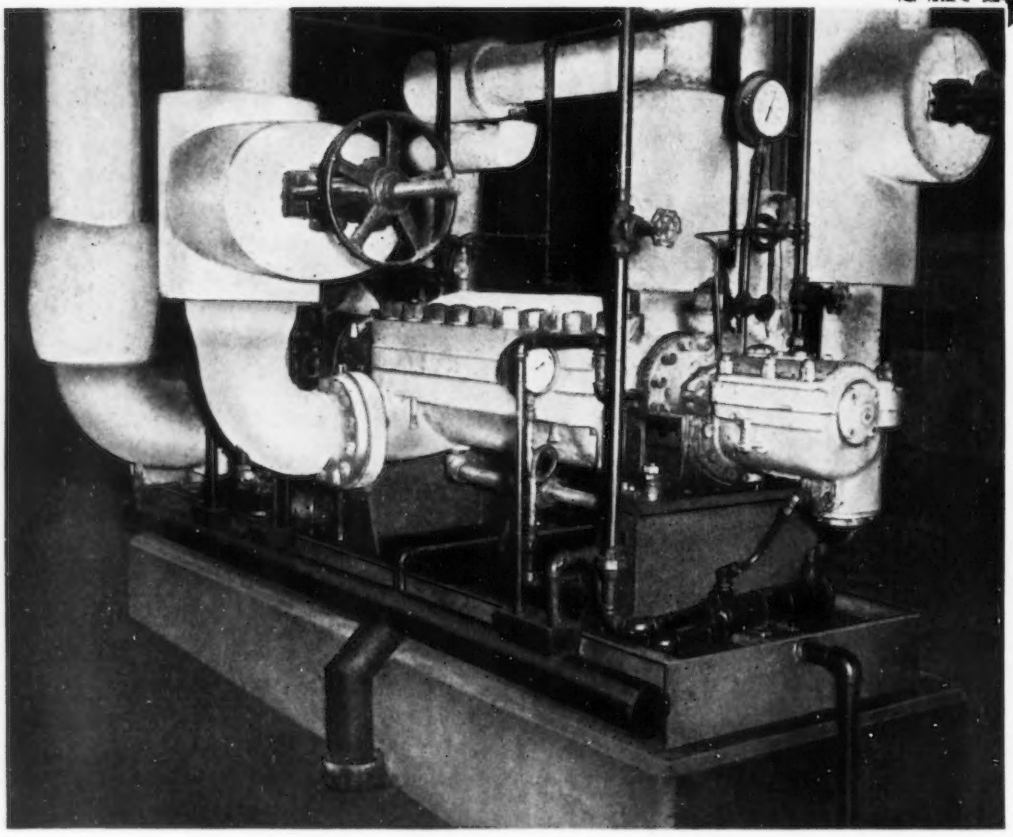
# Powell Valves

*108th year*

# Ingersoll-Rand feed water pumps
# CHOSEN BY ST. REGIS PAPER COMPANY
## for its new kraft paper mill





*Above, a line sketch of the new St. Regis kraft mill at Jacksonville, Florida. At the left, the I-R boiler feed pumps in the powerhouse.*

### Three HMTA 7-stage 400 gpm pumps serve the mill's boilers with 227°F feed water at 900 psi.

Another milestone in the long-range expansion program of the St. Regis Paper Company, this new kraft mill at Jacksonville, Florida is recognized as one of the most efficient operations in the industry. With a capacity of 100,000 tons of kraft paper and board annually, it was designed and constructed under the supervision of the company's own engineers.

Three Ingersoll-Rand 7-stage feed water pumps, of the modern horizontally-split HMTA design with Unit-Type rotor assembly, serve the black liquor recovery, bark, and oil fired boilers. These boilers produce 429,000 lb/hr of steam at 625 psi and 750F. Two of the pumps are driven by turbines and the third pump is motor driven.

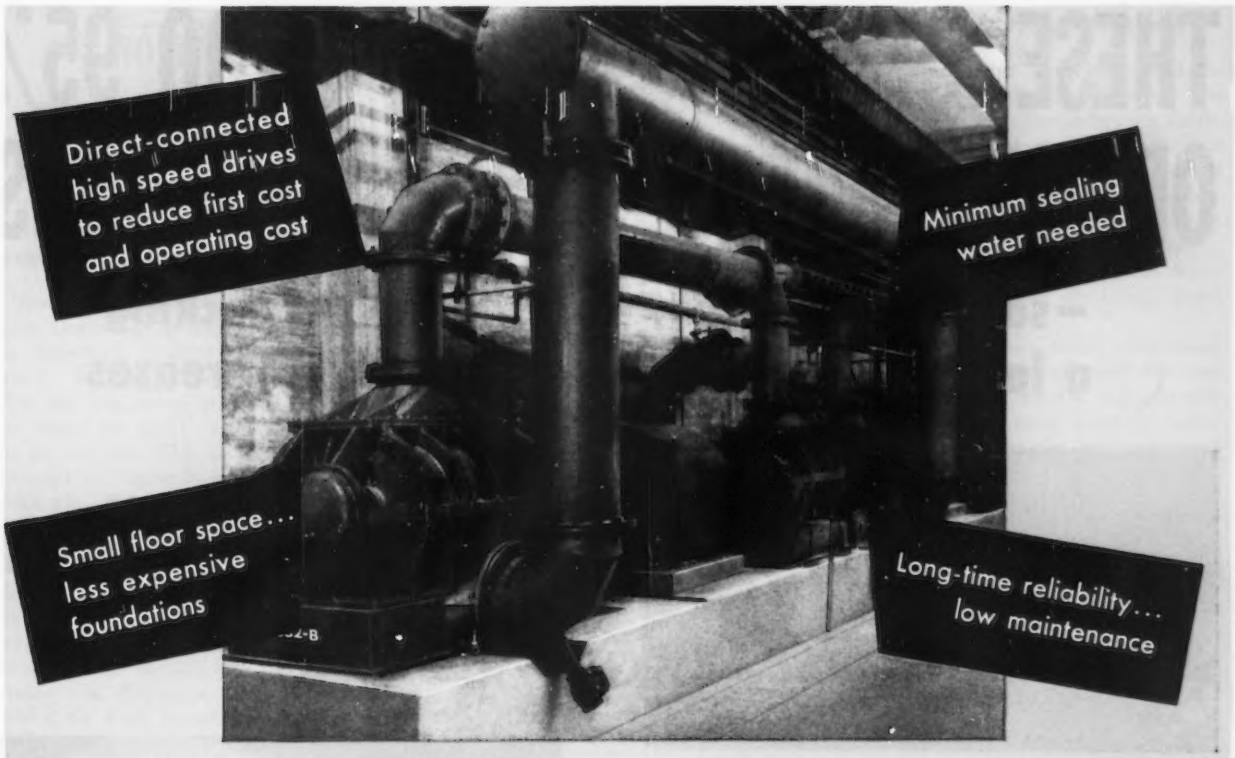
I-R multi-stage HMTA pumps provide high sustained efficiency, flexibility of operation, reduced maintenance and other important advantages inherent in the Unit-Type rotor design. They are available for pressures to about 1400 psi, temperatures to 650F and capacities to 1600 gpm. For further details, consult your nearest I-R representative.

**Ingersoll-Rand**

Cameron Pump Division
11 Broadway, New York 4, N. Y.

980-10

COMPRESSORS • CONDENSERS • AIR & ELECTRIC TOOLS • PUMPS • ROCK DRILLS • GAS & DIESEL ENGINES


Direct-connected high speed drives to reduce first cost and operating cost
Minimum sealing water needed
Small floor space... less expensive foundations
Long-time reliability... low maintenance

# BE SURE ABOUT THE "BIG 4" *when you select Vacuum Pumps*

To a large extent, these 4 basic values delivered by Roots-Connersville Vacuum Pumps account for the continuing upsurge in R-C installations for paper mills. We can show you figures from users that prove the economies in first cost, and in power and water consumption, because of high-speed (600 rpm or more), direct-connected drives.

Similarly, the records show remarkable freedom from maintenance, with resultant cost reduction, and more important, freedom from down time that can cause serious losses of production. These advantages accrue whether the installation consists of single or compound units—and regardless of capacity. Naturally, the larger the units, the greater the savings, both dollar-wise and percentage-wise.

We suggest that if you are considering vacuum pumps for new installations or replacements, you check with R-C engineers to see how you can reduce your costs without sacrificing any element of long-time, reliable performance. Or, ask for Bulletin 50-B-13 which gives detailed descriptions.

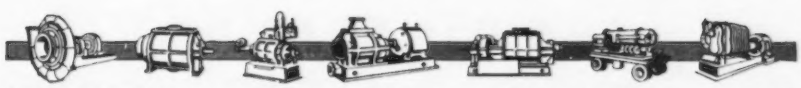
ROOTS-CONNERSVILLE BLOWER CENTENNIAL 1854 1954 A DIVISION OF DRESSER INDUSTRIES INC.

**ROOTS-CONNERSVILLE BLOWER**

Reg. U.S. Pat. Off.

BLOWER BUILDERS SINCE 1854

A DIVISION OF DRESSER INDUSTRIES, INC.
254 River Ave. • Connersville, Indiana



Centrifugal and Rotary Positive Blowers and Exhausters • Positive Displacement Meters • Vacuum Pumps • Gas Pumps • Inert Gas Generators • Sprazial Compressors

# THESE 3 SUN GREASES WILL DO 95% OF YOUR GREASE LUBRICATION JOBS

## —save you the cost and trouble of stocking a large number of "special purpose" greases

### FIBROUS • Sun Grease 844X

Has exceptional oxidation stability under high temperature conditions. Recommended for all antifriction bearings. A general-purpose, high melting point lubricant for pressure gun and grease cup application.

### BUTTERY • Sun Grease 300A

Especially designed for pressure lubrication of bearings operated at normal speeds and temperatures. Can be used in pressure guns, compression grease cups, or pressure lubrication systems. Has high water resistance and excellent pumpability at low temperatures.

### TACKY • Sun Grease 897

For open gears, chains, slides, cams, linkages and bearings. Used whenever "throw-off" must be avoided. High adhesive and cohesive characteristics. An excellent lubricant that is water resistant and does not need frequent application.

Of the 81 different Sun greases, these three can fill the vast majority of your needs. And lubrication simplification like this means worth-while economies for you in several directions. You can reduce the total amount of money you need to "invest" in lubricants. You can greatly lighten the housekeeping job of storing and handling your greases. And you can reduce the confusion and risk of error often created when personnel are required to choose from a large number of greases.

For lubrication points that do require special kinds, Sun offers a total of 78 other greases with a wide range of properties and characteristics.

Find out just how much you can economize by using Sun lubricants. Call in your Sun representative. Or write for information. Dept. PT-5

**INDUSTRIAL PRODUCTS DEPARTMENT**

**SUN OIL COMPANY**

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**PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL**

**Refiners of famous High-Test Blue Sunoco Gasoline**

PAPER TRADE JOURNAL

# TRENDS

## Casein Price Recoups From This Season's Low

Unexpected events have firmed the entire casein market and lifted prices of the Argentine product over a cent a pound. Today's duty-paid New York price, car lots, moves within a conservative range of 20/21 cents. Quotations are as high as 22½, according to Department of Agriculture reports. Two weeks ago, the price was 17½ cents to the U. S. consumer.

**U.S. Sells Its Milk Powder.** Three unrelated incidents wrought this surprise reversal. In the first place, sizable speculative U. S. buying in the Argentine reduced their inventories; (2) unseasonably cold European weather has delayed their flush season and hit casein production, thus forcing Italian and German consumers to buy heavily in the Argentine; and, last but not least, (3), the United States Government has disposed of its huge supply of skim milk powder that was looked on as weighty threat to the world market.

Market sources here take the view that this half-million pound U. S. stockpile had been expected to reach world markets at less than going prices, thus forcing all producers here and abroad to put their skim milk powder into casein.

Now that the U. S. has sold its supply to feed producers at 3½ cents a pound, anxiety from this source is removed. Danish, Dutch, French and other countries will now make milk powder and less casein than usual. Sales of the milk-powder stockpile therefore represents the major market shift, coupled with a cold Spring in European producing countries. Practically no offerings have come from France, and few are anticipated.

At the same time, speculative buying from the U. S. has taken up large amounts of the Argentine stock. Consumers also are buying.

**Domestic Outlook Dim.** The prospects of a revival of U. S. casein production are now seen as dim. Dealers see no assurance that our government will not soon be buying skim milk powder again, and there is some doubt that domestic producers will want to gamble on the possibility of being able to market their output of casein in competitive range with the Argentine, should this occur.

**Market Is Firm.** In short, it looks as though Argentina will be the main source of supply for U. S. consumers, and that today's market price will stabilize at about 21 cents. The Argentine market is so strong that inquiries from legitimate casein importers for a firm bid are not readily taken, and prices have advanced sharply.

New Zealand stocks are fractionally higher at 22/23 cents. Some domestic offerings are 24/27 cents for 30 mesh standard, f.o.b. plants. Canadian lots also are higher at around 20 cents, f.o.b. Canada.

## Buckwheat Anthracite Develops New Price Weakness

It appears that President John L. Lewis of the United Mine Workers now has new grief from the anthracite fields. Because of diminishing demand for this fuel and unprofitable operations (coal is reportedly selling at the mines for less than in 1948, despite a 30 percent rise in wages, supplies and fringe benefits, and steadily rising freight costs) some of the anthracite mines are being closed indefinitely.

Added to this, industrial conversions to oil and gas continue, and the one grade for which a market still prevails has again been forced down in price. Buckwheat or steam-size anthracite was dropped another 50 cents per ton on May 1 to approximately $5.75 a delivered ton. The April reduction was 25 cents.

Several paper mills are equipped to use this small anthracite and find it practicable. Over a period of years, it has been marketed by only a few companies. Now many are trying to market piled-up accumulations and competing for business by price slashes.

The market is definitely weak and the situation worsening. Should mine closings shut off supply, the trend toward oil conversions is bound to heighten.

—E.P.N.

**Paperboard Production (Tons)***

| | May 1 1954 | Apr. 24 1954 | May 2 1953 | Month of April |
|---|---|---|---|---|
| Production | 230,314 | 225,054 | 254,917 | 940,273 |
| New Orders | 251,496 | 199,437 | 341,666 | 890,288 |
| Unfilled Orders | 369,140 | 350,855 | 539,033 | 369,140 |
| % of Activity | 87 | 87 | 97 | 88 |

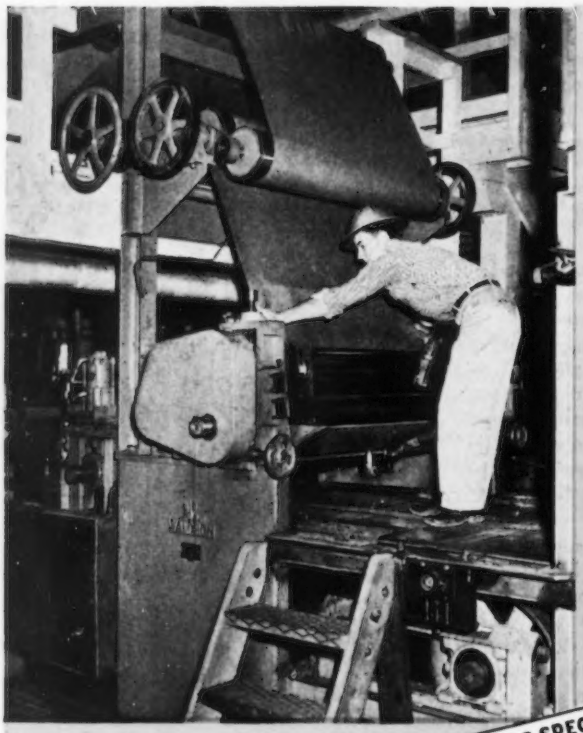
* Source: National Paperboard Assn.

*(Courtesy Borden Co.)*

**ARGENTINE EXPORTS OF CASEIN—1953**

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austria | 46 | — | 10 | — | — | — | 10 | — | 26 | — | — | — | 92 |
| Belgium | 11 | 4 | 15 | 1 | — | — | 23 | 48 | — | 22 | 28 | 20 | 172 |
| Brazil | 10 | 91 | 27 | — | 115 | 320 | 364 | — | 15 | 100 | — | 80 | 1122 |
| China | — | — | — | 3 | — | — | — | — | — | — | — | — | 3 |
| Chile | 9 | — | — | — | 17 | — | 116 | 30 | 50 | 13 | 65 | 8 | 308 |
| Cuba | 3 | — | — | — | — | — | — | — | — | — | — | — | 3 |
| England | 40 | 390 | 310 | 220 | 220 | 390 | 810 | 311 | 390 | 540 | 608 | 508 | 4737 |
| Finland | — | 346 | — | 200 | — | 200 | — | — | 260 | — | 100 | — | 1106 |
| France | — | — | — | — | — | — | — | — | — | — | — | 10 | 10 |
| Holland | — | 208 | 5 | — | 1 | — | — | 15 | 110 | 11 | 6 | 57 | 413 |
| Germany | 25 | 60 | 20 | — | 35 | 170 | 635 | 470 | 30 | 300 | 280 | 45 | 2070 |
| Italy | — | 25 | — | 25 | — | 161 | 121 | 527 | 190 | 650 | 350 | 267 | 2316 |
| Japan | — | 170 | 50 | 100 | 170 | 75 | 161 | 420 | 200 | 350 | 210 | 26 | 1932 |
| Mexico | 10 | 9 | 11 | 25 | 23 | 27 | 51 | 51 | 25 | 25 | — | — | 257 |
| India | — | — | — | 7 | 35 | 15 | 10 | — | 35 | — | 70 | — | 172 |
| Norway | — | 5 | 3 | — | 1 | 10 | 10 | 10 | 45 | 5 | — | 57 | 146 |
| Philippines | — | — | — | — | 30 | — | — | 20 | — | — | — | — | 50 |
| Malaya | — | — | — | — | 6 | — | 2 | 3 | — | — | — | — | 11 |
| South Africa | — | — | — | 10 | — | — | 5 | — | 10 | — | 10 | — | 35 |
| Sweden | 210 | 25 | 186 | — | 298 | 5 | 301 | 18 | 53 | 60 | 10 | 205 | 1371 |
| Switzerland | — | — | 12 | — | — | — | 29 | — | — | — | — | — | 41 |
| Peru | — | — | — | — | — | — | — | — | — | 6 | — | — | 6 |
| United States | 1906 | 2105 | 978 | 2024 | 1528 | 2342 | 1951 | 2928 | 3368 | 1661 | 849 | 138 | 21778 |
| Yugoslavia | — | — | 20 | — | — | — | — | — | — | — | — | — | 20 |
| Venezuela | 22 | — | 30 | 30 | 2 | — | 15 | 10 | 50 | 75 | 60 | — | 294 |
| Colombia | — | — | — | — | — | 2 | — | — | — | — | 5 | — | 7 |
| Totals | 2292 | 3438 | 1677 | 2645 | 2481 | 3717 | 4614 | 4861 | 4857 | 3818 | 2651 | 1421 | 38472 |

# a WALDRON Coater...



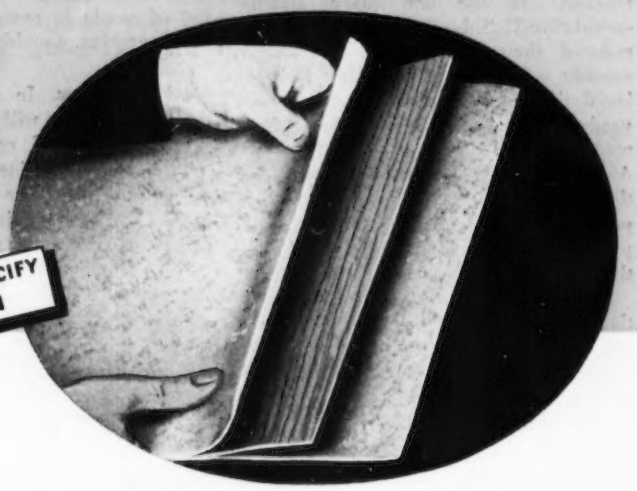
*Insures Quality Production of*

## PLY-VENEER*

*TRADE MARK REGISTERED

*A New Development of*

**WEYERHAEUSER TIMBER COMPANY**



THE LEADERS SPECIFY WALDRON

## *again WALDRON equipment is chosen for dependable operations in producing a new material*

PLY-VENEER*, the newest material for panels, containers and boxes, is constructed of Douglas fir veneer faced with Kraft containerboard on both sides. Only smooth, accurate coating of the containerboard sides with glue can produce the proper bond. For this critical operation Weyerhaeuser Timber Company uses modern WALDRON coating equipment.

It is significant that so many leading manufacturers select WALDRON equipment for all major converting operations.

*Write us for descriptive bulletins on modern methods and machines for coating, printing, embossing, treating, laminating and similar converting operations.*

*Our modern Laboratory is available to evaluate recommended processes. Submitting samples will assist us in our laboratory analysis of your particular problem.*

John WALDRON Corporation

P. O. BOX 791 · NEW BRUNSWICK · NEW JERSEY

*Leaders In Web Process Engineering Since 1827*

WEEK OF PAPER TRADE JOURNAL MAY 14, 1954

## New Pulp Chip Plant To Help Supply PFI

A new pulp chip plant at Harris Pine Mills, Pendleton, Ore., which is to be in operation by mid-May, will help supply Potlatch Forests, Inc., at Lewiston, Idaho, officials said.

C. G. Nagele, assistant general manager of the Harris Mills, said the plant when complete will produce about six boxcars of chips per day. PFI will use the chips to make high grade paper, he added. Mr. Nagele indicated the new $250,000 installation is about two-thirds completed and consists of a barker and pulp chip plant, which will convert former waste products from the furniture and box factory into chips.

## Scott May Enter Other Fields

Shareholders of Scott Paper Co., Chester, Pa., at the annual meeting voted to increase authorized common shares to 10 million from 5 million and to increase authorized indebtedness to $50 million from the present $25 million.

Shareholders also approved an amendment to Scott's charter authorizing the company to engage in other fields than wood pulp, paper and paper products.

Thomas B. McCabe, president, noting that Scott just completed a first quarter of record sales and earnings, said after the meeting, "We see no reason to believe second quarter results will be any less favorable than those of the first quarter."

In the first quarter, Scott earned $3,578,923, or $1.06 a common share, on total sales of about $44.4 million. Net income in the first quarter of 1953 was $2,711,053, or 87 cents a common share, and sales were $40,390,232.

## Box Plant Running

The new corrugated box plant of the River Raisin Paper Co. has opened in Sharonville, Ohio, Charles L. Wood, president, reported. David C. Stout has been appointed regional sales manager; Robert E. Hamblin, zone sales manager; and C. G. Hanf, general superintendent.

The spokesman said approximately 120 employes with recall rights are still laid off.

## Gaylord Gets Grand Award in Fibre Box Exhibit

Grand award in the 1954 Fibre Box Assn. Box Exhibit and Competition went to a ten-man shelter (background) made by the Gaylord Container Corp. for the Offices of Quartermaster, Research and Development Division, U. S. Army.

The Fibre Box Exhibit and Competition is sponsored annually by the Fibre Box Assn., made up of 161 manufacturers of fiber boxes. Three hundred eleven were submitted in the 1954 competition.

At the award ceremonies are (left to right), E. J. Lauth, Stone Container Co., Biglerville, Pa., a member of the competition committee; J. M. Arndt, Sr., vice-president and director of sales; W. P. Hicks, vice-president, General Sales Division; and J. M. Arndt, Jr., Sales Division, all of Gaylord Container Corp.

The grand award winner is an expendable octagonal ten-man shelter made of water resistant fiberboard and designed for the U. S. Army for Arctic use. Snow weight or wind load is absorbed by each of the four self-supporting sections.

## Alaska Mill to Start End of Month

Contrary to information published elsewhere, the mill of Ketchikan Pulp Co. at Ketchikan, Alaska did not start up the first of May. *Paper Trade JOURNAL* has been advised by the company management.

It is hoped that everything will be ready to produce pulp towards the end of this month.

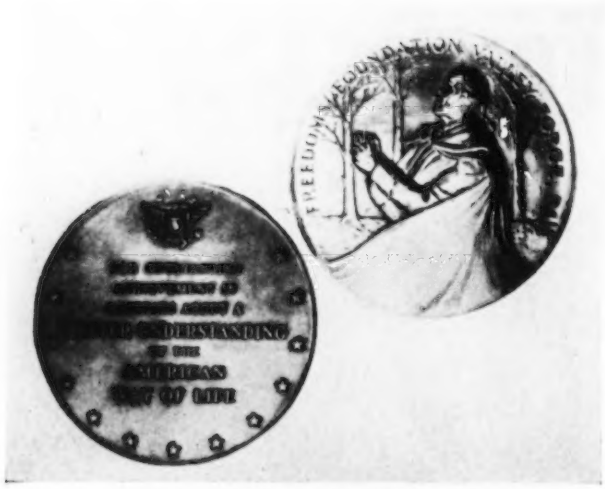
## Called Back to Work At Covington

Approximately thirty laid-off employes of West Virginia Pulp and Paper Co., Covington, Va., are being called back to work.

Sixteen of these were called in April 26 and 15 more were scheduled to report May 3.

A company spokesman said increased production in the board mill, a larger proportion of sheet orders, and an increasing need of replacements for vacations have made it possible to find employment for these people.

About half these recalls will be permanent, the others will be temporary.



## Paper Cup and Container Institute Honored

The Paper Cup and Container Institute was honored by Freedoms Foundation of Valley Forge at a special ceremony at Columbia University on April 27. The Institute was selected to receive a second place award, consisting of a George Washington Honor Medal and cash for its civil defense stockpiling program, which the Foundation cited as "An outstanding achievement in helping to bring about a better understanding of the American Way of Life during 1953."

The program, developed in cooperation with Civil Defense and Red Cross authorities, included the establishment — at the industry's expense — of stockpiles of twenty-five million paper cups, dishes and food containers in twenty strategic locations in the United States, for emergency disaster use by public agencies.

## K. C. Expands Roadbinder Program

An expanded fleet of eight tank trucks this spring has put Kimberly-Clark Corp.'s roadbinder program into high gear as demands increase for spent sulphite liquor in the maintenance of dirt and gravel roads.

More than 15 million gallons of roadbinder are expected to be used this season with requests already in from as far south as Milwaukee and a number of points in between. Local area requests are increasing.

*Cooperation*, the Kimberly-Clark employe magazine, tells the story of the expanded fleet in its current issue, with special mention of a new development in Roadbinder use.

Researchers and highway departments, including the state of Wisconsin, are interested in the new development which is use of roadbinder to reclaim worn blacktop roads at a cost far below that of new roads.

Kimberly-Clark is cooperating in the research project which has involved test roads in Ripon, in Ashland, Brown and Shawano counties and research is continuing.

Lawrence Hopkins, director of the Kimberly-Clark roadbinder program, helped to direct the test road project at Ripon. The old asphalt surface was broken up, the materials put in windrows which were given applications of spent sulphite liquor which then was worked into the materials. In the case of the Ripon project, some new materials such as sand texture material and some gravel were added. After a thorough mixing with roadbinder, the road was laid out again and rolled.

The strong binding properties of spent sulphite liquor has led to its increasing use as a binder for road materials and to this new possible use in reclaiming old wornout blacktop roads. The costs for reclaiming such roads may roughly approximate $500, according to *Cooperation*.

### Paper and Board Production

According to the American Paper and Pulp Association, the ratio of United States paper production to mill capacity for the week ending May 1, 1954, was 91.2 percent, compared with 91.3 percent revised, for the preceding week. The ratio was 93.6 percent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending May 1, 1954, was 87 percent, compared with 87 percent for the preceding week, and 97 for the corresponding week last year.

(Detailed statistics on page 50.)

## Institute Starts Research In Forest Tree Genetics

The Institute of Paper Chemistry at Appleton, Wis., has recently broadened the program of research which it carries on in behalf of the pulp, paper and paper board industry of the United States by initiating investigation in forest tree genetics and breeding.

The venture reflects growing recognition of the need to learn how and to what degree genetic make-up influences both qualitative and quantitative aspects of the growth of the trees which furnish raw material. Also in view is the possibility that tree breeding may often offer opportunity to secure economic advantage by improving upon the heredity of the average wild tree, upon which the paper and allied industries now depend.

The program will be pursued in cooperation with various projects at The Institute of Paper Chemistry, with other tree breeding centers and co-ordinating groups, and with agencies concerned with soils, diseases, insects and forest management. It is designed with the aim of accelerating the common effort to gain insight into the genetic behavior of species which are important sources of pulpwood, and to produce improved growing stock for pulpwood production.

Dr. Philip N. Joranson recently joined the staff of The Institute of Paper Chemistry, to be responsible for the direction of the program. During the past two years, he was on leave from Beloit College to investigate the possible utility of polyploid heredity as a practical means of lengthening the fiber and enhancing the growth rate of aspen. Support for this work was provided jointly by the Marathon Corp. and the Rhinelander Paper Co.

As far as possible, research activities included in the new Institute program will be chosen in a manner which will represent the interests of mills throughout the country. In the beginning, both fundamental studies and breeding work will be focused for the most part on problems associated with the Lake States area. The project which Dr. Joranson initiated earlier will be continued and intensified and will be supplemented eventually with related aspen studies of a fundamental nature. Attention to species other than aspen is also contemplated.

## Build New Milk Carton Plant

A new converting plant for the production of Pure-Pak paper milk containers will be constructed in northeast Philadelphia by the Single Service Division of International Paper Co. The plant will supplement the output of the company's existing plant in Norristown.

# PRICES

## MARKET WOOD PULP

Second Quarter Contract Prices Per Short Air-Dry Ton

| | Delivered Basis | | Varying Freight Allowances | | |
|---|---|---|---|---|---|
| | U.S. | Canadian | Swedish | Finnish | Norwegian |
| Groundwood | | ‡$60.00/$95.00* | §$77.50/$82.50§ | §$80.00/ — | |
| Kraft, Bleached | 140.00/147.50 | 145.00/150.00 | §140.00/142.50§ | | §$142.50/ — |
| Semi-bleached, Kraft | 130.00/135.00 | 130.00/135.00 | §130.00/135.00§ | 130.00/135.00* | |
| Kraft, Unbl. | 95.00/105.00 | 100.00/135.00 | *105.00/110.00* | *105.00/135.00* | |
| Sulphite, Blchd. | 140.00/ — | 140.00/ — | §135.00/140.00* | 140.00/ — * | §135.00/142.50*§ |
| Sulphite, Unblchd. | 120.00/ — | 120.00/ — | §115.00/122.00* | 120.00/125.00* | |
| Sulphite, Unbl. Gl'sn. | | 124.00/ — | *124.00/ — | | |
| Soda, Blchd. | 140.00/ — | 140.00/ — | | | |

‡ F.o.b. Shipping Point. § On Dock Atlantic Ports. * Freight allowed.

## RAG MARKET

### New Domestic Cotton Cuttings

Delivered Mill Basis

| | Per 100 lbs. |
|---|---|
| No. 1 White Shirts | $12.50/$13.00 |
| No. 1 Unblchd. Muslins | 14.50/ 15.00 |
| Blchd. & Unblchd. Underwears | 15.50/ 16.00 |
| Blchd. Canton Flannels | 11.00/ 11.50 |
| No. 1 Light Silesias | 7.50/ 8.00 |
| No. 1 Light Prints | 6.00/ 6.50 |
| No. 1 Blue Overalls | 7.25/ 7.75 |
| Suntan Khakis | 5.50/ 6.00 |
| Fancy Shirts | 6.50/ 7.00 |
| Mixed Khakis | 3.50/ 4.00 |
| Cottonades | 3.75/ 4.25 |
| No. 1 Washables | 3.50/ 3.75 |

### Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

| | Per 100 lbs. |
|---|---|
| Mixed White | $2.75/$3.00 |
| Cotton Pants & Overalls | 2.00/ 2.25 |
| Thirds and Blues, Repacked | 1.65/ 1.75 |
| No. 2 Roofing Rags | nominal |

## COTTON LINTERS

Memphis Market

F.o.b. Oilmills

| | | May 4 Per 100 lbs. |
|---|---|---|
| Grade 1 | n.a. | |
| 2 | n.a. | / $9.00 |
| 3 | 1st cut—felting | 8.00/ 6.50 |
| 4 | | 6.00/ 4.50 |
| 5 | | 4.25/ 3.25 |
| 6 | * 2nd cut—chemical | 3.00/ 3.00 |
| 7 | | 3.00/ 3.00 |

* Based on 73% cellulose.

### Bagging

(Prices to Dealers, F.o.b. N. Y.)

| | Per 100 lbs. |
|---|---|
| Foreign Gunny | $4.00/$4.50 |
| Foreign Scrap Burlap | 3.00/ 3.75 |
| Heavy Wool Tares | 4.00/ 4.25 |
| Austr. Wool Pouches | 4.00/ 4.50 |
| Domestic Manila Rope | 5.50/ 6.00 |
| Domestic No. 1 Sisal Strings | 5.00/ 5.25 |

## WASTE PAPER MARKET

Mill Prices, F.c.b. Car Shipping Point - Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal. See TRENDS.

| | New York May 10 | Boston May 8 | Chicago May 7 | Los Angeles May 5 |
|---|---|---|---|---|
| No. 1 Mixed Paper | $8.00/ 9.00 | $10.00/ 11.00 | $7.00/ — | $13.00/ — |
| No. 1 News | 12.00/ 13.00 | 12.00/ — | 15.00/ — | 13.00/ — |
| Overissue News | 15.00/ 17.00 | 16.00/ 20.00 | 18.00/ 20.00 | 13.00/ — |
| Mill Wrappers | 8.00/ 17.00 | 12.00/ 15.00 | 10.00/ — | 11.00/ — |
| Old Corrugated Containers | 13.00/ 15.00 | 15.00/ 16.00 | 16.00/ — | 19.00/ — |
| No. 1 Sorted Br. Kraft Paper | 40.00/ 45.00 | 35.00/ 50.00 | 17.00/ — | 45.00/ — |
| New Double Kr. Ld. Corr. Cuts | 40.00/ 50.00 | 42.50/ 50.00 | 40.00/ 50.00 | 35.00/ 45.00 |
| New 100% Kraft Corr. Cuts | 55.00/ 62.50 | 50.00/ 60.00 | 60.00/ 62.50 | 40.00/ 45.00 |
| New Br. Kraft Env. Cuts | 70.00/ 75.00 | 65.00/ 77.50 | 65.00/ — | 40.00/ 45.00 |
| New Br. Kr. Bag Waste Frntd. | 65.00/ 75.00 | 65.00/ 75.00 | 55.00/ — | 40.00/ 45.00 |
| No. 1 Groundwood Shvs. | 25.00/ 35.00 | 25.00/ 30.00 | 25.00/ — | 27.00/ 35.00 |
| White Newsblanks | 60.00/ 65.00 | 45.00/ 55.00 | 40.00/ — | 50.00/ 55.00 |
| No. 1 Soft Wht. Shvs., coated | 60.00/ 70.00 | 70.00/ 80.00 | 65.00/ — | — / — |
| Hd. Wht. Shvs. | 100.00/105.00 | 95.00/110.00 | 100.00/ — | 95.00/ — |
| Hd. Wht. Env. Cuts | 120.00/130.00 | 110.00/130.00 | 105.00/ — | 105.00/ — |
| Col. Tab. Cards | 45.00/ 55.00 | 55.00/ 60.00 | 50.00/ — | 28.00/ — |
| Manila Tab. Cards, bales | 75.00/ 85.00 | 80.00/ 85.00 | 75.00/ — | 55.00/ — |
| No. 1 Col. Ledger | 37.00/ 45.00 | 40.00/ 50.00 | 45.00/ — | 28.00/ — |
| White Ledger | 57.50/ 65.00 | 60.00/ 65.00 | 55.00/ — | 40.00/ 45.00 |
| Mixed Book & Mag.† | 18.00/ 19.00 | 18.00/ 22.50 | 12.50/ — | — / — |
| No. 1 Rep'd. Hvy. Books‡ | 25.00/ 30.00 | 25.00/ 35.00 | 27.50/ — | 9.50/ 12.00 |

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

# PRICES OF MATERIALS

| | | | |
|---|---|---|---|
| Aluminum sulphate: | | | |
| cml. bags, c.l. wks. | cwt. | $1.85 | / — |
| iron-free, c.l. wks. | cwt. | 3.55 | / — |
| Casein, acid prec.: | | | |
| dom. sh. pt. c.l. | lb. | .24 | / .30 |
| Arg. ex. dock, duty paid | | .20 | / .21 |
| New Zeal. do. | | .22 | / .23 |
| Caustic soda: | | | |
| c.l. wks. solid, 76% | cwt. | 3.70 | / — |
| flak. & grd. 400-lb. drums, c.l. | | 4.10 | / — |
| liquid 50% tanks | | 2.55 | |
| liquid 70% tanks | | 2.65 | |
| China clay: | | | |
| dom. air-float, c.l. wks. | ton | 10.00 | |
| water-washed, lump, filler | ton | 11.00 | |
| coating | ton | 17.60 | /30.50 |
| Imported, ex. ship | short ton | 16.00 | /30.00 |
| Chlorine: | | | |
| single-unit tanks, works | cwt. | 2.93 | / — |
| multiple unit, 2-5 cars per yr. | | 3.83 | / 5.00 |
| Formaldehyde: | | | |
| USP, inh. dms. c.l. wks | lb. | .0666/ | — |
| l.c.l., E. wks. | lb. | .071 | / — |
| Lime: | | | |
| hydrated bags, wks. | tons | 14.50 | /15.50 |
| Gum rosin: | | | |
| K, M, N, drms, c.l. Savan, | cwt. | 7.50 | / 7.55 |
| Rosin size: | | | |
| 70%, gum & pale grds., tank cars, southb, sh. pt. | cwt. | 6.60 | / 6.65 |
| Salt cake: | | | |
| dom. bulk, c.l. wks. | ton | 19.00 | / — |
| Soda ash: | | | |
| light, 58%, bags, wks. | cwt. | 1.65 | |
| bulk | cwt. | 1.35 | |
| Sodium silicate, 40° Be.: | | | |
| tank-cars, wks. | cwt. | 1.00 | / — |
| drums, c.l. wks. | cwt. | 1.35 | / — |
| 42° Be. WW, | | | |
| tank-cars, wks. | cwt. | 1.60 | / — |
| drums, c.l. wks. | cwt. | 1.95 | / — |
| Sodium peroxide: | | | |
| dms. c.l. E. of Miss. | lb. | .186 | |
| l.c.l. do | lb. | .191 | / .201 |
| Soybean, protein: | | | |
| chem. isol., wks. c.l. bags | lb. | .25 | / .25½ |
| Sulphuric acid: | | | |
| 60° Be. cbys. c.l. wks. | cwt. | 1.75 | / 2.00 |
| l.c.l. wks. | cwt. | 2.30 | / 2.45 |
| tank-cars, wks. | ton | 16.30 | /18.60 |
| Sulphur: | | | |
| crude, c.l. mines, contract, | long ton | 25.50 | /27.50 |
| f.o.b. vessels Gulf | do. | 27.50 | /30.50 |
| Sulphur dioxide: | | | |
| liquid, coml. cyl., wks. | lb. | .09 | |
| multi-unit cars | lb. | .0535 | |
| Starches: | | | |
| corn, multiwalls, c.l. prod. plant: | | | |
| pearl | cwt. | 6.39 | / — |
| white, dextrines | cwt. | 7.78 | / — |
| chlorinated | cwt. | 8.14 | / — |
| potato, Idaho, c.l. wks. W. | cwt. | 6.30 | / — |
| East, fr. all. 50 cents cwt. | | | |
| potato, Maine, f.o.b. wks. | cwt. | 6.25 | / — nominal |
| Talc: | | | |
| domestic, sacks, c.l. wks. | ton | 25.00 | /30.00 |
| Titanium dioxide: | | | |
| anatase, c.l. deld. E. bags | lb. | .22½/ | .23 |
| l.c.l. deld. | lb. | .23½/ | .24 |
| rutile, c.l. deld. | lb. | .24½/ | .25 |
| l.c.l. deld. | lb. | .25½/ | .26 |

# NEWS OF ASSOCIATIONS

## Superintendents Change Meeting Date

The meeting date of the Michigan Division, American Pulp and Paper Mill Superintendents Assn. has been changed from May 20 to May 27. It will be a dinner meeting at the Hotel Harris. A. N. Perry, of the Signode Steel Strapping Co., will have charge of the program.

Date for the annual outing of the Superintendents has been set for June 8. Additional details will be given later.

### Superintendents Local Meeting Dates

| DATE | DIVISION | PLACE |
|---|---|---|
| May 20-22 | Pacific Coast Joint TAPPI | Gearhart Hotel Gearhart, Ore. |
| May 27 | Michigan | Harris Hotel Kalamazoo, Mich. |
| June 4 | Miami Valley Div. | Orr Felt & Blanket Co. Piqua, Ohio |
| Sept. 2-4 | New York-Canadian | Saranac Inn Saranac Inn, N. Y. |
| Sept. 23-25 | Northeastern Div. | Poland Spring House Poland Spring, Maine |
| Oct. 1-2 | Penjerdel, Fall Meeting | Bedford Springs Hotel Bedford Springs, Pa. |
| Oct. 13-15 | Southern & Southeastern Fall Meeting | George Vanderbilt Hotel Asheville, N. C. |

### TAPPI Local Meeting Dates

| DATE | DIVISION | PLACE |
|---|---|---|
| May 17 | Chicago | Chicago Bar Assn. Chicago, Ill. |
| May 19 | Eastern District Empire State | Milfranks Restaurant Glens Falls, N. Y. |
| May 19-20 | Lake Erie | Hotel Carter Cleveland, Ohio |
| May 27 | Delaware Valley | Engineers Club 1317 Spruce Street, Philadelphia, Pa. |
| June | Kalamazoo Valley | Exact date and place to be announced. |
| June 4 | Central District Empire State | University Club, 431 E. Fayette St., Syracuse, N. Y. |
| June 8 | Metropolitan District Empire State | Fraunces Tavern Pearl & Broad Sts., N.Y.C. |
| June 10-13 | Empire State Annual Meeting | White Face Inn Saranac Lake, N. Y. |
| June 11-12 | New England | Oceanside Hotel Magnolia, Mass. |
| June 18-19 | Maine-New Hampshire | Marshall House New Harbor, Maine |

National Meetings are shown under "Remember These Dates" on page 5.

## Big Party Held At Kalamazoo

The 1954 Ladies' Night Dinner Party of the Michigan Division of the Superintendents Association was held on April 24. It was the largest Ladies' Night Dinner Party in the history of the Division, and was considered outstanding in every respect.

After the dinner, members and guests danced to the music of Charlie Schaffer's Orchestra. Part of the program, following the custom of the Division was sponsored by the Allied Industries group. The toastmaster of the evening was John L. Vanderberg of the D. A. Howard Co.

The May meeting of the Division originally scheduled for the 20th of the month will be held on the 27th instead. As usual, it will be at Hotel Harris, Kalamazoo. A. N. Perry of Signode Steel Strapping Co. will be in charge of the program.

July 27, 1954, has been given by the Division as the date for its annual outing. The outing will be held at the Kalamazoo Country Club.

## Paper Napkin Assn. To Hear Hartinger

The Paper Napkin Assn. will hold its Spring meeting at Moraine on the Lake Hotel, Highland Park, Ill., on May 20 and 21. The guest speaker will be the recently elected president of the National Paper Trade Assn., H. A. Hartinger, of the Anchor Paper Co. of St. Paul. Mr. Hartinger's subject will be "What the Merchant Wants From the Supplier" and will be based upon a recent survey of paper merchants to determine in order of preference the important qualities or services which they would expect from suppliers.

## Miami Valley Superintendents Discuss Finishing Problems

The April 20 Dinner Meeting of the Miami Valley Division of The Superintendents Association was devoted to a panel session on Finishing Problems.

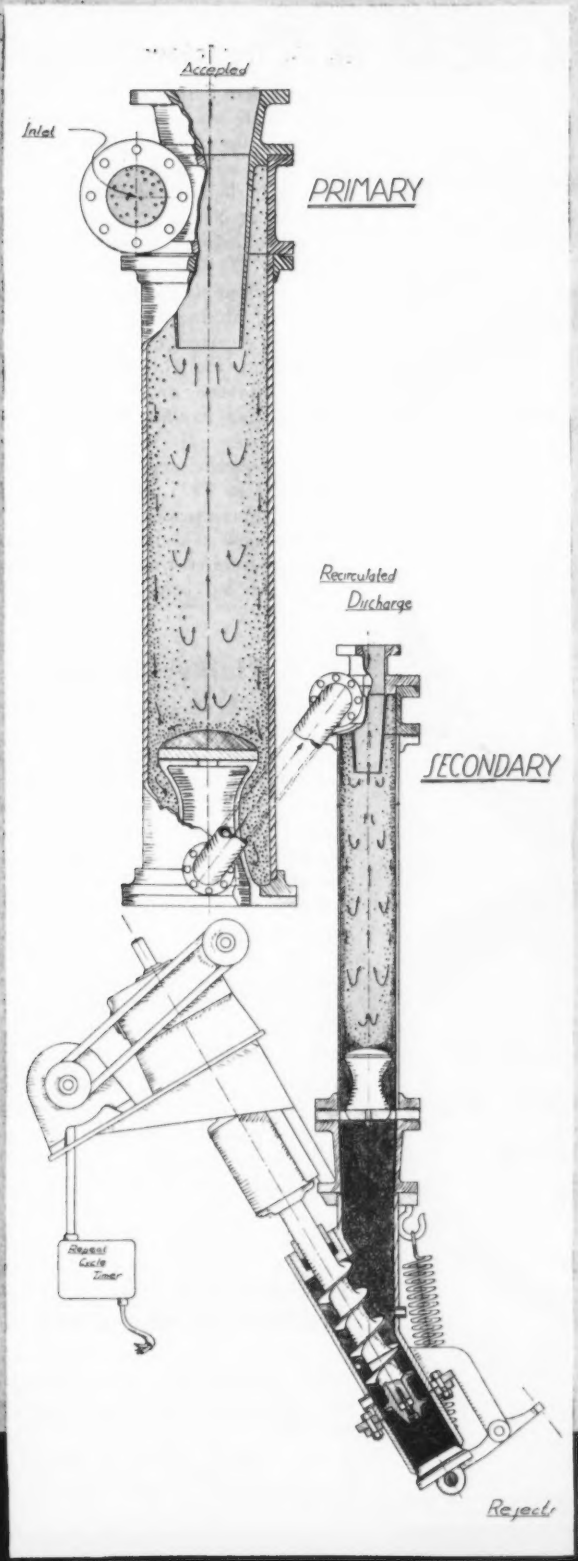
Dean Newell of Philip Carey Manufacturing Co. acted as moderator of the panel. James Ozias, Oxford Miami Paper Co.; William Reigers, Beckett Paper Co.; Harold Noe, The Champion Paper and Fibre Co.; and Howard Harrison, Crystal Tissue Co. made up the panel. Russell Vannata, Excello Paper Products Co., who was to have been on the panel, was absent.

Mr. Ozias spoke on materials handling; Mr. Reigers on trimming problems; Mr. Noe on problems of sorting and fan count; and Mr. Harrison on tissue mill problems. Harry Hadley of the Gardner Board and Carton Co. was requested to replace Mr. Vannata.

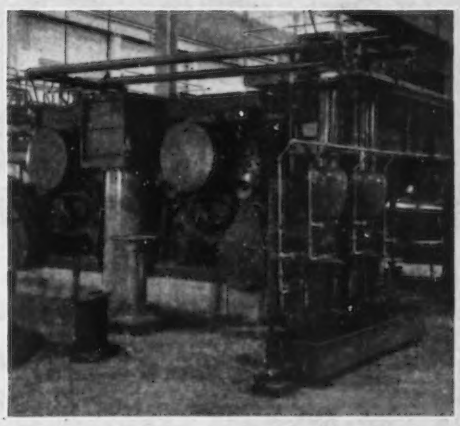
# BIG JOBS OR SMALL

# THE DIRTEC BEATS 'EM ALL

***— when it comes to thorough separation and complete removal of dirt from stock***




The "King Size" Dirtec (12″ primary and 4″ auxiliary) has a capacity of 1400 gallons per minute. This cross section sketch shows how it works when handling big volumes of heavy, coarse dirt taken out of board stock. It may be equipped with a continuous dirt evacuator, as shown.



These Dirtecs, with 6″ primary and 2″ auxiliary, are applied to Bird Screen tailings, one Dirtec unit per Screen, and handling up to seven tons of screen rejects per day.

Dirtecs are extraordinarily effective, dependable and economical whether used on pulp or board stocks, ahead of the paper machine on all grades of stock, or as tailings units for Bird Screens.

**BIRD MACHINE CO.**

**SOUTH WALPOLE, MASS.**

# PAPER PEOPLE

## New Superintendents At Big Island

National Container Corp. reports the following changes in its organization at Big Island, Va.:

Sidney R. Brown, paper mill superintendent, has resigned to accept a similar position with the St. Joe Paper Co., St. Joe, Fla. He is succeeded by James H. McGee, formerly of St. Marys Kraft Corp., St. Marys, Ga. Mr. McGee has had many years of experience in the manufacture of kraft paper and boards, including service at Union Bag and Paper Corp. at Savannah, Ga., and the St. Marys Kraft Corp.

Cecil B. Curry, formerly pulp mill superintendent, has been promoted to the new post of general superintendent at the Big Island mill. Mr. Curry joined the organization 13 years ago. Previously, he was connected with the Mead Corp., Union Bag and Paper Corp., and St. Marys Kraft Corp.

## K. C. Transfers Saunders

George H. Saunders has been transferred from his assignment as superintendent of the chlorine plant at the Kimberly, Wis., mill of Kimberly-Clark Corp. to the pulp department of Staff Technical Research at Neenah.

Mr. Saunders has been with Kimberly-Clark for 15 years, coming to the corporation after graduation from Michigan College of Mining and Technology from which he received a degree in chemical engineering. He worked in the corporation's Ordnance division which manufactured gun mounts and fuses during the war years. He was named assistant chlorine superintendent at the Kimberly, Wis., mill in 1945 and two years later became superintendent.

In his new assignment, Mr. Saunders will be associated with the pulp research division of the corporation.

## W. F. Pfeiffer Retires

William F. Pfeiffer, vice-president of the Hinde & Dauch Paper Co. and a member of its board of directors, retired April 30 after 40 years of service with the company. Mr. Pfeiffer, for many years chief financial officer of Hinde & Dauch, will remain on call as a financial consultant.

He joined Hinde & Dauch in 1914 as an assistant auditor. He subsequently held the posts of assistant secretary, secretary and secretary-treasurer. He was elected to the board of directors in 1932 and became a vice-president of the company in 1952.

Through the years, Mr. Pfeiffer was an active participant in the growth of Hinde & Dauch from a group of three factories and five mills to a major industrial organization of twelve factories and five mills.

## Hoffman Named Statistician at Oxford

Edward R. Hoffman has been appointed chief statistician in the technical service of the Oxford Paper Co., Rumford, Maine.

Mr. Hoffman comes to Oxford from the Hammermill Paper Co., where for the past 18 years he has had considerable experience in electrical engineering, physical research, and statistical quality control.

The year 1954 sees Lindsay enter upon a second half century of service to the paper industry. We pledge our utmost effort towards making that period more and more resultful.
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Abrasives · Grinding Wheels · Grinding and Lapping Machines · Refractories · Porous Mediums · Non-slip Floors · Norbide Products

## Sjodahl Named Tech. Supr. At Gardner Board

Lars J. Sjodahl has been named technical supervisor of the Middletown, Ohio, carton plant of the Gardner Board and Carton Co. Previously, he had been a chemist and printing specialist with the Interchemical Corp., Chicago, Ill., and the Curtis Publishing Co., Philadelphia, Pa.

## Granger to Represent Oregon Pulp & Paper

Oregon Pulp and Paper Co. has appointed Harry W. Granger as a sales representative in Southern California. Mr. Granger will assume his duties as of May 1, operating out of Oregon Pulp and Paper Co.'s Los Angeles office.

## McClarnan Returns To St. Regis

St. Regis Paper Co.'s Midwestern Multiwall sales district has appointed Neil McClarnan as a sales supervisor in that district, with headquarters in Chicago. Mr. McClarnan has been associated with the multiwall bag industry for the past twenty-one years, and spent five of the earlier years of that period with the St. Regis bag manufacturing division on the Pacific Coast.

Mr. McClarnan came to St. Regis from the Jaite multiwall bag division of National Container Corp., where since 1952 he had been general sales manager. From 1938 to 1952 he was a salesman for Jaite in charge of the Chicago district, and from 1934 to 1938 he was assistant to the production superintendent in the St. Regis multiwall bag plant at Los Angeles.

## To Honor W. M. Crane, Jr.

Winthrop M. Crane, Jr., chairman of the board of Crane & Co., Dalton, Mass., is to be honored at a reception in the Dalton community house, May 23, to mark the 50th anniversary of his association with the business. Mr. Crane is the son of Winthrop Murray Crane, former governor and United States senator, who was one of the founders of the company.

## Frank Moulton Named Shipping Supt.

Frank Moulton, a member of the Nekoosa-Edwards Paper Co. organization for 31 years, has been named superintendent of the Port Edwards shipping department, effective May 1.

Mr. Moulton started work in the Port finishing and shipping room. His first job, however, was in 1920 in the power department. After a brief break in service, he rejoined Nepco in 1923, became a paper scaler in 1924, and in 1925 was named a foreman in the shipping room.

## Smiddy Named Gen. Sales Manager of Missisquoi

Missisquoi Corp. has appointed W. E. Smiddy as general sales manager of the corporation.

Mr. Smiddy became associated with Missisquoi in 1920. He started in the sales department at the mill in Sheldon Springs, Vt., and in 1930 was transferred to the New York City office. He was the New York territory representative and office manager until 1953, when he was appointed assistant sales manager. He will continue to make his offices at 551 Fifth Avenue, New York 17, N. Y.

## Summerlin Named Sales Mgr. at Westfield River

John A. Summerlin has been appointed sales manager of the Westfield River Paper Co., Inc., Russell, Mass.

Mr. Summerlin was head of the food production division of the Angier Corp. of Framingham, Mass., before joining Westfield River.


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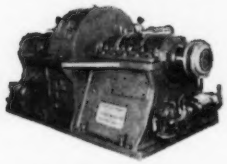

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TRENTON 8, NEW JERSEY

## Murphy Succeeds Wight At Bird & Son

New director of personnel for Bird & Son's 3,000 employees, the majority of whom belong to eight different union locals, is John J. Murphy, named to this post on May 1 by the company president, Axel H. Anderson. The appointment follows the retirement of Ralph M. Wight at the end of April. Mr. Murphy had been assistant director of personnel.

# OBITUARIES

**Howard F. Holman,** 75, chairman of the board of directors of the Diamond Match Co., died May 5 in Good Samaritan hospital, Suffern, N. Y. All of Mr. Holman's business life was spent with the Diamond Match Co., which he joined on July 5, 1899, when he was 21 years old. He served successively as assistant secretary, secretary, secretary and treasurer, vice-president and treasurer and, for the last 11 years, as chairman of the board.

**James Pattison Nicol,** 59, manager of industrial relations for the Gair Co., Toronto, Ont., died May 2 after a long illness. A native of Scotland, he came to Canada in 1913 and joined the Ontario Paper Co. Subsequently he became associated with the Gair Co. Mr. Nicol was former vice-president of the International Brotherhood Paper Makers and was one of the founders of the Niagara District Council of Paper Mills Union.

**Earl G. Hayner,** 68, retired head of the orders department of the West Virginia Pulp & Paper Co., Mechanicville, N. Y., died April 30.

**William H. Lee,** 77, chairman of the board of directors of the Lockport Felt Co., Lockport, N. Y., died April 29. He joined the firm in 1905, was made general manager the following year and bought out the controlling interests in 1916. He was a former New York State Senator.

**Walter Cloud, Sr.,** 72, manager of U. S. Paper Mills, West DePere, Wis., died April 14. He had been connected with that mill since 1936. His career in the industry began in the mill of Hall Bros., Noblesville, Ind.

From 1913 until 1933, he was employed by the Chicago Coated Board Co., Chicago, Ill. In 1933, he went with U. S. Gypsum Co. to manage its mill in Kansas City, Mo. He remained at that location until he went to DePere.

**Gilbert P. Bothwell,** 62, member of the merchandising staff of the Hammermill Paper Co. for a quarter of a century, died at Erie, Pa. on April 25.

**Jacob Kay Lasser,** 58, several times Secretary of Lockwood Trade Journal Co., Inc. and senior member of the firm of J. K. Lasser & Co., which he formed in 1923, died at his home in New York City on May 11. He was a licensed Certified Public Account of New York, New Jersey and California.

He was a member of the American Institute of Accountants, New York Society of Certified Public Accounts, New Jersey Society of Certified Public Accountants, National Association of Cost Accountants and at the time of his death was Chairman of the New York University Institute on Federal Taxation.

Among his published works are "Your Income Tax", "Your Corporation Tax", "Business Tax Guide", "Handbook of Accounting Methods" and numerous other publications.

He specialized in auditing the accounts of firms in the graphic arts industries including publishing concerns and paper mills. Lockwood Trade Journal Co., Inc. was his first client. He is a trustee of the George Saxe Macdonald Trust.

Surviving are his widow, Terese Reuben Lasser; a daughter, Barbara Ann Gray and a son, Donald Judd Lasser.


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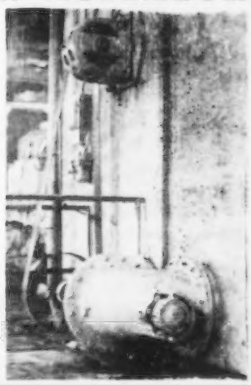
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# NEW LITERATURE

**Why You Should Use Rex Z-Metal Chain.** (Bulletin 53-56) Contains illustrated sales copy as well as actual photographs of Rex Z-Metal chain at work, including a chain conveyor in a pulp mill. Chain Belt Co., 4701 W. Greenfield Street, Milwaukee, Wis.

**The Chemistry of Melamine.** (56p. Booklet) Includes sections on applications, specifications, physical properties, chemistry and structure, toxicity, test methods and an extensive bibliography. Also laboratory samples are available. Manufacturers Chemicals Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

**Electrified Log Carriage Drives.** (Bulletins GEA-5786 and 5992) Former provides operational and maintenance information on log-carriage drives. Latter contains detailed information on speed variator amplidyne-controlled log-carriage drives. General Electric Co., One River Road, Schenectady 5, N. Y.

**Forest Statistics for Alabama.** (Forest Survey Release 73) Covers report of Southern Forest Survey, Philip R. Wheeler, In Charge, and is divided into seven sections—Highlights of the forest situation; Accuracy of the Survey; Summary tables; Detailed tables; Change Tables; Definitions of Terms and Standard Tables. Available free of charge from U. S. Dept. of Agriculture, Forest Service, Southern Forest Experiment Station, 704 Lowich Bldg., 2026 St. Charles Avenue, New Orleans 13, La.

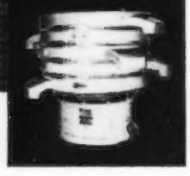
**B. F. Goodrich Conveyor and Elevator Belting.** (32p. Manual) Includes 42 photographs illustrating step-by-step fashion of proper belt-splicing procedure. Also describes splicing materials, tools, best conditions for splicing and repair, method of splicing cord and fabric belts and special procedure in splicing rayon belts. B. F. Goodrich Rubber Co., 500 S. Main street, Akron, Ohio.

**Guide for Figuring Texrope Drives.** (Interim bulletin 20B6956B) Provides in condensed form necessary information on new method of calculating horsepower capacity of a "Texrope" V-belt drive; also means of determining ratings for both standard construction and high capacity "Texrope" V-belts. Allis-Chalmers Mfg. Co., 994 S. 70th street, Milwaukee, Wis.

**Fielden Electronic Temperature Control, Series 97.** (Bulletin) Operates on principle of change of resistance of wire-wound sensing element with changes in temperature and is applicable in production processes for electric, steam and hot water heaters, plastic extrusion presses, kilns and dryers, etc. Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. Fourth street, Philadelphia 33, Pa.

**Heavy Duty Protected Induction Motors.** (Bulletin 37-205) Contains il-


SCREENING NEWS



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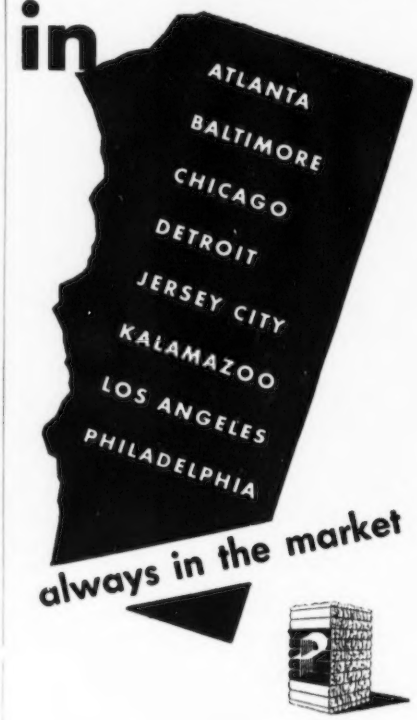


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**SUTHERLAND REFINER CORPORATION**

TRENTON 8, NEW JERSEY

* U.S. Patent No. 2,591,106

lustrated sales copy and NEMA dimensions of heavy-duty protected motors. Electric Products Co., 1725 Clarkstone Road, Cleveland 12, Ohio.

**Humphrey Manlife Elevator.** (Bulletin HB-54) Provides illustrations of complete line which are used in paper and pulp mills to provide quick employee transportation to and from sampling and operating floors. Also includes comprehensive product data on four standard models plus information on special equipment necessary to meet various specific operating conditions and comply with varying state codes. Humphrey Elevator Co. Inc., 895 Division street, Faribault, Minn.


INTERNATIONAL WIRE WORKS

Fourdrinier Wires

MENASHA, WISCONSIN


**Improving Wet Strength of Paper.** (Application Engineering Data Sheet F-54-1) Describes and illustrates control system used by large eastern paper mill manufacturer to control flow of "wet strength" resins to pulp; also alum dilution system which eliminates need for large alum storage tanks in paper mill. Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.

**Ladish Controlle Quality Fittings.** (Catalogue 55) Gives detailed dimension data and specifications on complete line. Also includes 56 page technical data section featuring new, easy to use, allowable stress and P/S tables, maximum allowable working pressure charts and up-to-date tables on latest provisions of applicable piping codes and standards for solving piping problems. Ladish Co., 5481 S. Packard Avenue, Cudahy, Wisconsin.

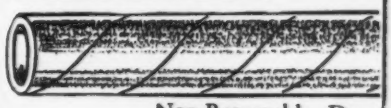
**Neoprene Sprayed Coatings and Sheet Lining.** (Bulletin) Outlines protective qualities of Neoprene in applications affected by sunlight, heat, abrasion, oil, cold and various chemicals. Also includes table on organic chemicals for which Neoprene lined tanks and piping can be recommended. Protective Coatings Div., Metalweld, Inc., Scotts Lane & Abbottsford Avenue, Philadelphia 29, Pa.

**Penn Pressure Gage-Pneumatic Transmitter.** (Bulletin 1025) Contains illustrated sales copy, installation methods, data on capacities, pressures, operating details and diagrams. Penn Industrial Corp., Penn Bldg., 4110 Haverford Avenue, Philadelphia 4, Pa.

**Portable Potentiometer Indicators and Resistance Thermometers.** (Bulletin A-303-1) Includes details on operating adjustments, design features, test circuits, measuring elements and instrument specification, standard scales available, and tables listing type of thermocouple or resistance bulb recommended for each range, as well as degrees of temperature indicated by each scale division. Also covers use of portable pyrometers in checking installed pyrometric instruments and replacing potentiometer temporarily out of service. Foxboro Co., 36 Neponset Avenue, Foxboro, Mass.

**Stearns Magnetic Transmission Equipment.** (Bulletin 226-C) Provides ready reference for figuring right transmission equipment for individual applications. Also contains complete figures, diagrams, dimensions, capacities, horsepower and torque ratings on Sterns clutches, brakes and clutch-brake combinations. Stearns Magnetic, Inc., 609 S. 28th street, Milwaukee, Wis.


MERKOR



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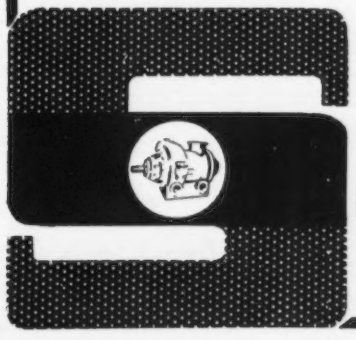

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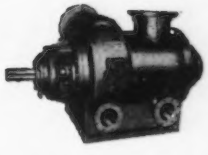
Sutherland Breaker Trap



SUTHERLAND REFINER CORPORATION

TRENTON 8, NEW JERSEY

# Diversified New Paper and Paperboard Products Widen General Usage

**Elce P. Nuttall**

Associate Editor Paper Trade JOURNAL

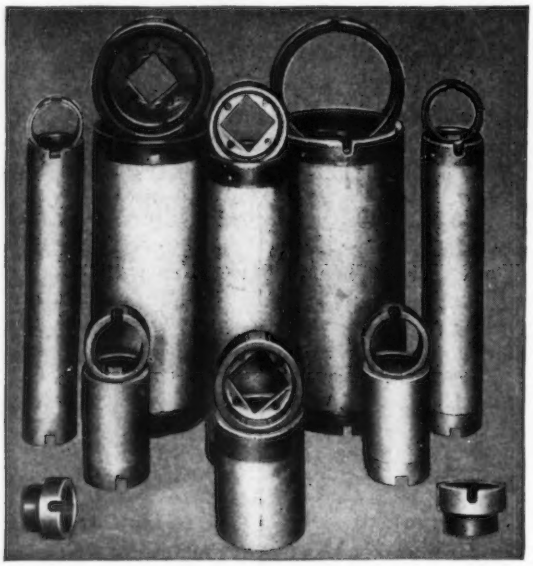
Like America's industrial production, the growth performance of the U. S. paper and paperboard industry is often looked on as a miracle and a breath-taking wonder. The industry's optimistic appraisal of yet unexplored dominions make others wonder whether paper and board men are either deluded or misled by daydreams.

Paper industry optimism is born of self-confidence backed by a wealth of mental and physical energies, and the assurance that, with the sole exception of printing materials, paper usage by general industry and the home is still in its infancy.

Its recognized use, for instance, as sanitary tissue is very moderate in the lower-income families. Television, radio and other advertising forms are educating the American family to the convenience, hygiene and economy of towels, tissues and napkins, diaper inserts, toilet bowl mops, garbage bags and disposal units, refrigerator and deep-freeze food containers, and other uses ad infinitum.

New packaging ideas, display boxes, fiber boxes designed to sell more merchandise; stronger fiber boxes constructed to supplant wooden crates and cut down on freight costs; new book enamels, duplicating papers, napkins, gummed tapes, towels and tissues are reaching the market daily. Fertile boxboard minds have even devised a "cat castle" as a home for the family pet. Equipped with easy entrances and exits, it is a companion piece to the doghouse.

These and multitudinous other products were exhibited by producers at the recent National Paper Trade Assn.



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**Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.**

**Samples of caps or cores will be gladly submitted**

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.

## Riegel Exhibit Includes Glass-Fiber Paper

A glass-fiber paper developed for air filtering in an atomic energy project was among the products shown by Riegel Paper Corp. Now sold for commercial applications, the new product is available for industrial air filtering and like uses.

A 25 percent rag translucent meter paper for direct-print Diazo-type machines which can be used without stencils to reproduce copy direct from original letters was a feature of the Strathmore Paper Corp. display.

Double-coated letterpress and offset enamels were introduced by Kimberly-Clark Corp.

New mimeo, bond, and two new duplicator papers in 16 and 20-lb. substance were included in the Boston Paper Board Co. exhibit.

Industrial wipers of four-ply tissue were featured by Sorg Paper Corp., which also showed its new family line of notion, millinery and shoe bags matched with boxes of Gardner Board & Carton Co.; its Christmas wrapping papers; and a clearer, cleaner blue-white Sorex bond, index and mimeograph paper.

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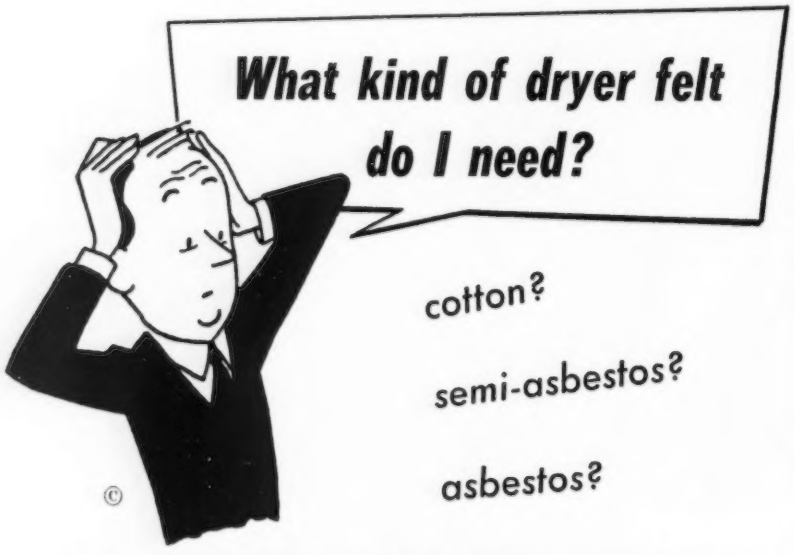
**QUALITY PETROLEUM PRODUCTS**

**Duplex waterproof papers,** garment and pants bags, liquor-notion, millinery and heavy duty bags were displayed by Hudson Pulp & Paper Corp. as additions to their expanding lines.

**Lower cost freezer papers** and restyled frozen food packagings were shown by Safeway Division of Yorkville Paper Corp.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Frank Clawson, Kalamazoo, Mich.
West Coast
M. J. Maguire, Portland, Oregon
Southern States
R. S. (Bob) Davis, Greenville, S.C.

**BRANDON DRYER FELTS**


**A reinforced furniture wrap** in 120-inch width, machine-creped for flexibility and strength was among the new items of Thilmany Pulp & Paper Corp.

**Multi-purpose Hercules food-storing containers** were a highlight of the Plymold Corp. display. Described as a scientifically-improved container that provides simply and easy closure without bulging or wedging, the heavy, laminated white paper board cylinders are doubly-paraffined inside and out for all-purpose storing of solids or liquids. Six quarts or 12 pints are included in the consumer package which is on sale in Super Markets and other outlets.

**A gummed paper** called Perfection #360 is designed to stick to non-porous surfaces. Originally made to stick to silicone, it can be used on polyethylene, polystyrene, metals and lacquers, the manufacturer—Paper Manufacturers Co. —says.

**Reinforced tape,** known as Diamond Back snake tape, is composed of two sheets of quality kraft asphalt-laminated, gummed with animal adhesive, and containing a diamond-mesh reinforcement, was included in Angier Corp. exhibit. Also shown were VPI polyethylene and kraft laminates for rust preventive packaging in low temperatures; a paper tarpaulin of asphalt and fiberglas reinforced paper for outdoor storage of goods and equipment.

**Single-sheet cushioners** called Sherm-A-Pak were shown by Sherman Paper Products Corp. Created to provide "fatigue-resisting and live cushioning" through a permanently crimped process whereby each fiber is forged and fixed to give resiliency and continued protection in long hauls in dry or damp weather, the new product is available in natural kraft and bleached sheets. Greaseproof barrier sheets; spot-seal wrap which stick only to itself; and a special neutral corrugated sheet with "controlled H-Ion concentration" for special applications, also were displayed.

**Protective wrapping for aluminum ware** was among the tissue specialties shown by Crystal Tissue Co. This new interleaved tissue has a soft inner sheet which prevents scratching of the highly-polished surfaces; the heavier outer wrapping protects against "burning" and rubbing-through from the outer packing.

## Brown Co. Moves Into Consumer Towel, Tissue Market

Two new lines of high-quality toilet paper for household use, and an all-

purpose household roll towel are being introduced into the consumer's market in New England this week by Brown Co., Berlin, N. H.

A foremost producer of industrial and institution paper towels for many years, Brown Co. last year introduced bleached and natural toilet tissue for the institutional field. Its activities are now being extended to consumer products. Initial marketing will be undertaken in the Boston area supported by advertising and a sales promotion program.

Trademark names and package designs adopted are Nibroc for the roll towels, Softan for natural color toilet tissue, Sofwite for white toilet tissue. Features of the latter are high quality, absorbency, supersoft texture and strength. Special qualities built into the Nibroc towels make them an all-purpose kitchen towel which fulfills the slogan "Rub and Scrub With Nibroc; the All-Purpose Towel, Wet Or Dry," advertising will say.

## Canadian Pulp Production

Canadian pulp production in March was 821,323 tons as compared with 725,609 tons in February and 754,054 tons in March 1953. Exports in March were 169,431 tons as against 168,355 tons in February and 154,781 tons in March 1953. Pulp produced, used in Canada, and exported during the first quarter of the year were all greater than in the corresponding period of 1953.

Pulp production for the year to date was 2,296,576 tons as compared with 2,165,389 tons a year ago. During the first quarter 1,763,249 tons of pulp were used in Canada as against 1,702,198 tons a year ago. Exports increased from 429,076 tons in the first quarter of 1953 to 487,978 tons this year.

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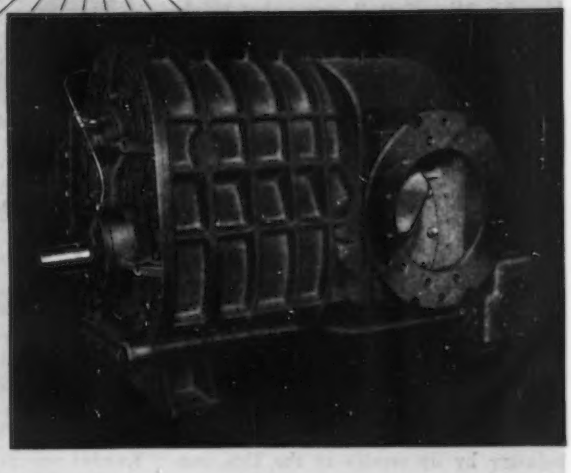

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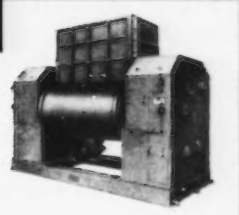


# Paper and Board Officially the Nation's Fifth Industry

There is no longer reason to doubt that by dollar value of annual shipments, the U.S. paper and board industry now ranks fifth in the national economy, according to Elce P. Nuttall, associate editor of *Paper Trade JOURNAL*.

Speaking to the Annual Ladies Night gathering of Metropolitan Division of TAPPI, Fraunces Tavern, New York, May 11, Miss Nuttall stated that by the Annual Survey of Manufacturers, 1952, just released by the Bureau of Census, paper and board displaced Cotton Woven Broad Fabrics in 1951 with an excess of shipments of over $367 million. The total for paper and board was $4,057,587,000, for cotton woven broad fabrics $3,690,583,000. This compares with 1947 totals of $3,294,623,000 for cotton woven broad fabrics and $2,812,048,000 for paper and board.

During 1952, paper and board retained fifth place with an excess of over $302 million, and it is expected paper will considerably widen this gap for the peak year of 1953.

Future growth will be forced on the industry by its service to the U.S. consumer and by population expansion, Miss Nuttall believes. Homemakers want inexpensive waste basket liners in

decorator tints; they want paper towels at a price within their family budget; they want garbage bags that don't burst at the seams; and among other things, furniture and window polishers.

An especially large group had gathered to honor Ralph W. Kumler, who is retiring from Technical Service, American Cyanamid Co., New York. As a token of the affectionate regard in which he is held and in appreciation of his years of service to Metropolitan TAPPI, Mr. Kumler was presented with a gold wrist watch.

A movie produced by American Cyanamid also was shown.

## Trees for Tomorrow Notes 10-Year Gains

By the end of this year Trees for Tomorrow, Inc., will have distributed six million free trees to 4,988 landowners, machine planted another 3,046,750 for 162 persons, who bought their stock from state nurseries, and prepared forest management plans for 122,000 acres of woodlands owned by 339 persons.

That is what Folke Becker of Rhinelander Paper Co., president of the organization, reported to the latter's board of directors, which observed the organization's 10th anniversary this week, at a meeting in Merril, Wis. Mr. Becker also pointed out that member firms of Trees for Tomorrow now own and have under forest management more than 500,000 acres of certified industrial forest lands in Wisconsin on which 45 million trees have been planted and on which another 2,649,000 are being planted this spring.

"Many idle acres are now woodlots, and vast stretches of barren lands in northern Wisconsin are becoming forest," Mr. Becker pointed out. "The paper and power industries are built on a belief that there can be expanding opportunities for the people of this country."

## Agree to Resume Work At Calhoun

Approximately 330 plumbers and steamfitters, employes of Grinnell Co., Inc., and members of Chattanooga Plumbers and Steamfitters Local 43, AFL, who walked off the job April 28 at Bowaters Southern Paper Corp. project at Calhoun, were scheduled to return to work May 5 after what was termed "a satisfactory settlement" was reached.

Following a meeting between C. B. Finger of Atlanta, construction superintendent for Grinnell, and James Lee Case of Chattanooga, business agent for the Chattanooga union at Calhoun, Mr. Finger said the agreement reached was "entirely satisfactory," but that certain details remained to be worked out. This, however, he said, would not prevent the workmen from returning to their jobs.

The reported cause of the walkout, termed unofficial last week by Mr. Case, was the discharge of an employe by Grinnell. Mr. Finger confirmed the statement that the walkout was unofficial, but termed the cause "merely a disagreement."

## Bird Plans New Carton Plant

Bird & Son plans to construct a plant to manufacture set-up cartons for shoes in Lewiston, Maine. Completion is scheduled for November.

### AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

| | | | | | |
|---|---|---|---|---|---|
| 1954 | Apr. 3<br>94.1 | Apr. 10<br>94.6 | Apr. 17<br>93.3 | Apr. 24<br>91.3r | May 1<br>91.2 |
| 1953 | Apr. 4<br>91.3 | Apr. 11<br>91.1 | Apr. 18<br>93.6 | Apr. 25<br>94.1 | May 2<br>93.6 |

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1953 | 94.5 | 94.6 | 94.4 | 92.7 | 93.9 | 93.8 | 82.2 | 94.7 | 92.7 | 97.2 | 94.6 | 82.8 | 92.3 |
| 1954 | 94.2‡ | 94.5‡ | 93.7‡ | | | | | | | | | | |

COMPARATIVE YEARLY SUMMARIES

| | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 105.3 | 100.9 | 90.3 | 95.3 | 101.6 | 95.5 | 94.4 | 93.8 |
| Year Average | 101.7 | 92.1 | 83.7 | 95.8 | 98.0 | 88.6 | 92.3 | |

‡ Preliminary.
r Revised.

PAPERBOARD OPERATING RATIOS†

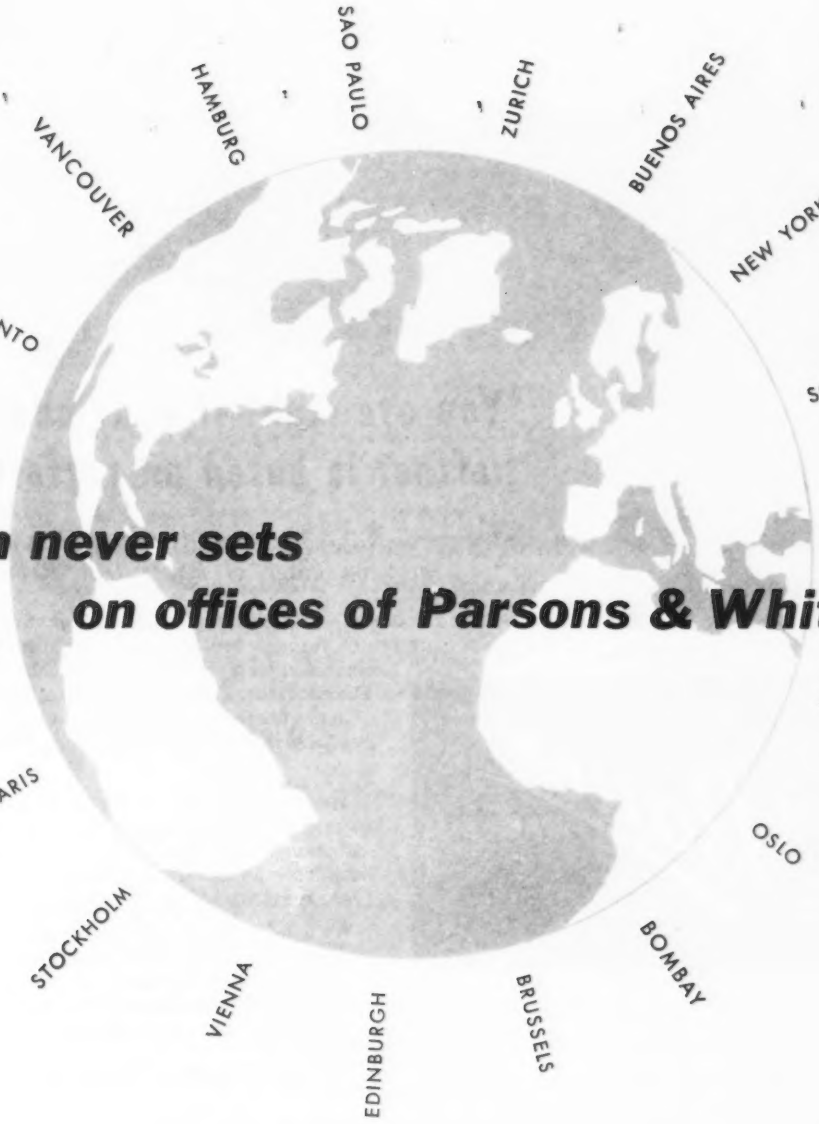
| | | | | |
|---|---|---|---|---|
| 1954 | Apr. 3<br>89 | Apr. 10<br>89 | Apr. 17<br>91 | Apr. 24<br>87 | May 1<br>87 |
| 1953 | Apr. 4<br>95 | Apr. 11<br>90 | Apr. 18<br>96 | Apr. 25<br>95 | May 2<br>97 |

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1953 | 91 | 95 | 95 | 95 | 96 | 93 | 81 | 98 | 94 | 97 | 94 | 79 | 93 |
| 1954 | 89 | 89 | 90 | 88 | | | | | | | | | |

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

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**paper-making machinery**
**graphic machinery**

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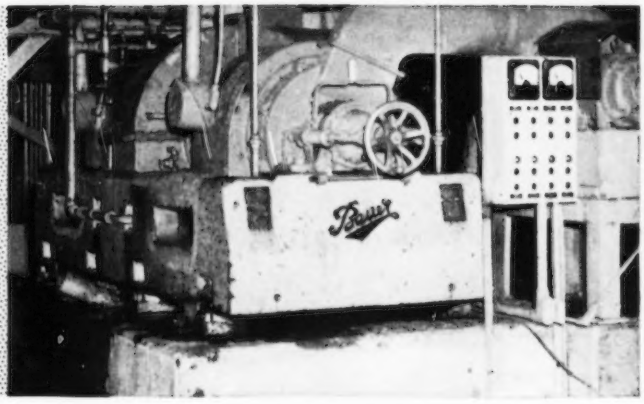

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Bauer Double Disc Refiners produce unique fiberizing and dispersing results through brushing and rolling manipulations combined with vigorous agitation and turbulence. The effects are especially important in the refining of short fibered pulps when a paper or board of improved appearance and greater strength is required.

Bauer

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**THE BAUER BROS. CO.**

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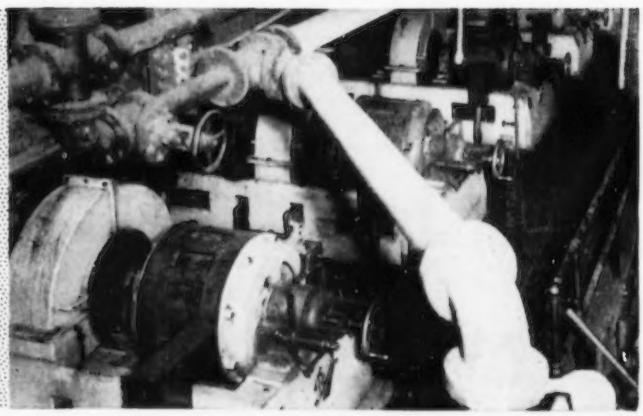


# Equipment and Product Performance

This is the issue our readers asked for. It is the result of extensive research on our part. Trained interviewers of an experienced research organization visited a large number of mills and talked to our readers. The most important thing that we asked the interviewers to investigate was, What kinds of published material interested the mill men most?

A careful study of many interviews showed that the managers and superintendents, engineers and technical directors, all wanted more information on new equipment and products, and particularly down-to-earth practical reports on how these were actually working out in the mills.

The editors of Paper Trade Journal then went to work planning this issue. We found the mill men most co-operative in supplying articles. When it was not possible for the men on the job to write the articles, they invited the editors to visit the mills and supplied us with information from which articles could be written.

If you like the idea of this issue, we would like to hear from you. If you have ideas on subjects for such articles in the future, we will be glad to receive your suggestions.

# How the Beta-Ray Scanner Provides Felt and Wire Life Data at Southland

**James D. Sadtler**

Assistant Chief Chemist, Southland Paper Mills, Inc.

Southland Paper Mills at Lufkin, Texas, purchased a beta-ray measuring device, designed and built by Tracerlab, Inc., to fit the requirements for use as a routine control test of the mass distribution across the width of the sheet from the news machines. It is located in the dry end control laboratory for accessibility to the news machines. The instrument, as shown in Figure 1, consists of a beta-ray measuring device, a strip chart recorder, and a feeding mechanism for the material to be measured. The sensitivity and weight range of the beta gauge are adjusted by calibration with known mass per unit area materials. The feeding mechanism consists of driven rolls on each side of the detector head with a lineal speed of about 4 feet per minute. The recorder has a variable speed drive to enable variation in the ratio of chart length per foot of material passing through the measuring area.

**FIGURE 1—THE TRACERLAB SCANNER** consists of a beta-ray measuring device, a strip chart recorder, and a feeding mechanism to handle the material being measured.

## Measures Fiber Distribution

The Beta-Ray Scanner was initially used in determining mass distribution on the newsprint in order that corrective actions could be taken to eliminate light or heavy streaks in the paper. This has led to increased production due to reduction in the number of breaks and better weight distribution across the sheet. Samples of newsprint from other mills were studied and the information from the weight profiles was used in determining the choice of headbox to replace one at Southland which was rusted out at the bottom.

## Reveals Felt Wear

Uneven felt wear across the machine was leading to short felt life and difficulty in building hard reels. The press rolls were originally crowned as specified by the manufacturer. These crowns had failed to give even felt wear either through faulty weight applying systems or incorrect crown. The crowns had been changed by guessing at the proper direction to go to achieve longer felt life and evenly worn felts. The lack of a simple means of measuring the wear pattern on the used felts had seriously limited the work. Prior to the use of the Beta-Ray Scanner in order to make a measurement of the felt wear, it was necessary for most mills to submit a strip of used felt to the manufacturer for the running of tensile tests. These tests required several weeks and the information was difficult to use. Some of the large multi-machine mills have their own tensile test machines, but the time required is much greater than with the Beta-Ray Scanner.

## Preparing Felt Strip

To prepare a strip of felt for the Beta-Ray Scanner after removal from the machine it is necessary to dry the felt. This is easily accomplished with the hot air available around the paper machines. After drying, a 10″ wide strip the width of the machine is cut for running the profile. It takes about 5 minutes to make the weight profile.

Figure 2 is an example of the felt profiles from the 1st press of one of the machines at Southland along with the profile of a new felt sample. The "original crown" profile came from a felt run with a total crown of .201". This felt was badly worn in the center and excessive crown seems to be the most obvious source of this wear.

## Crown Correction

The first step in attempting to correct this was to reduce the total crown to .180" and prorate it between the press rolls according to their diameter, disregarding any effects of density, rigidity or plastometer readings. The "corrected crown" profile indicates that the center wear has been reduced considerably and edge wear has been increased although it is not serious enough to cause severe difficulties. After studying this condition through several felts, the crown was reduced to .1675" and divided almost equally between the press rolls. Exceptional felt life has been achieved from some felts, but the inadequacies of the lever arm method of loading the presses is felt to be responsible for some of the poor felt life. The "new felt" profile is shown to illustrate the sawtooth pattern that is present due to either the method of manufacturing or to the method of feeding through the Beta-Ray Scanner.

To determine the effect on the profile of fines, pitch, and dirt, tests were made on felts before and after cleaning. The same general profile was achieved with the elimination of some random heavy spots due to the densely filled areas.

## No Cyclic Pattern

To determine if a cyclic wear pattern existed in the machine direction of the felts due to oscillation of the press rolls, lengthwise strips of the felt were run through the Beta-Ray Scanner. The profiles indicate random variation above and below an average line with variation in the amount of foreign material present in the felt probably accounting for most of the variation. No evidence of cyclic variation was found.

## Compared with Tensile Test

Through the cooperation of a multi-machine mill, a comparison of the tensile test results and the Beta-Ray Scanner results was made on a large number of their used felts. This mill uses a wide variety of felts of both one and two-sided construction. It was found that the weight profile on the Beta-Ray Scanner was not matched by the plotted results of the tensile test. There was a slight amount of correlation between the fill tensile test and the weight profile, but due to the fact that the tensile test method is a spot test whereas the weight profile is continuous, a true correlation would be exceptional.

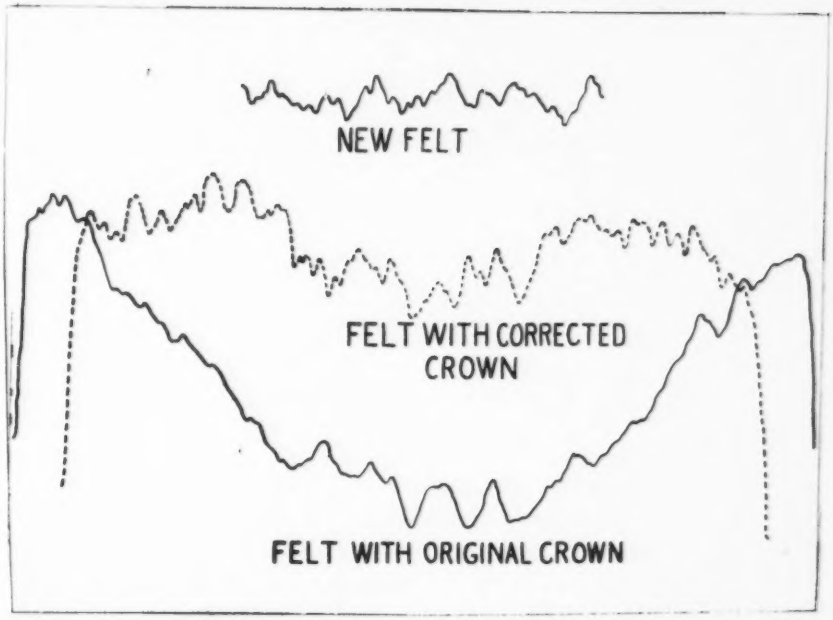



**FIGURE 2—COMPARATIVE PROFILES OF FELTS** from the first press position show how the scanner revealed excessive crowning of the roll and how more even felt wear was obtained after crown was corrected.

The crowns in the press sections of each machine are being studied separately, although the two machines are almost identical in width and press roll size. It has become apparent that a slight change in construction can require a considerable change in the crown.

## Wire Profiles

An investigation has been started on the weight profiles of our used wires to determine sources responsible for uneven wear. The used wires were found to have a profile very similar to that of the "original crown" felt, except that the edges were not worn so severely. The profile indicated 15 per cent more wear in the center of the wire as compared to the places of least wear, and this wear is probably due to lumpbreaker crown or uneven flat box wear with other sources being possible. These used wires have a sawtooth pattern superimposed on the general wear profile which is due either to wet streaks in the sheet or bunching of the shute or warp wires in use. This weight change is on the order of magnitude of one wire per inch or 2 per cent by weight. The wet streaks which possibly caused the sawtooth pattern are due to the velocity pattern present in the headbox which is not subject to correction at the slice. The crown has been reduced in one of our lumpbreaker rolls from .060" to .029", and a definite improvement in the used wire profile has been apparent.

## Checking New Wires

While engaged in this work on the profiles of the used wires, it was decided that a check on the accuracy of the Beta Ray measuring device on mesh materials could be achieved by securing samples of new wire of more than one mesh and weight. Samples of 56 x 44, 56 x 42 and 56 x 40 fourdrinier wire from a loom weaving the 56 x 42 mesh wire used on our machines were run through the Beta Ray Scanner for comparison of the profiles.

The new wire profiles were found to be very level except that a possible fault in the loom had caused a bunching of the warp wires in one place about five feet from one side, and the rest of the wire to the edge was under the average weight. If this is a fault of the loom, it was probably in the comb spacing. This deformity existed in all three of the wire samples although each was a different mesh and a different weight. The accuracy of the weight range was checked by weighing the new wire samples and calibrating the Beta-Ray Scanner so that it would be possible to compare two profiles on the same strip chart.

## Startling Results

Through the use of the Beta-Ray Scanner, Southland has achieved improved clothing life on the machines and improved machine efficiencies. It has demonstrated some very interesting applications to all textile, weaving, and solid sheet industries where profiles might play an important part in properly indicating true distribution of mass.

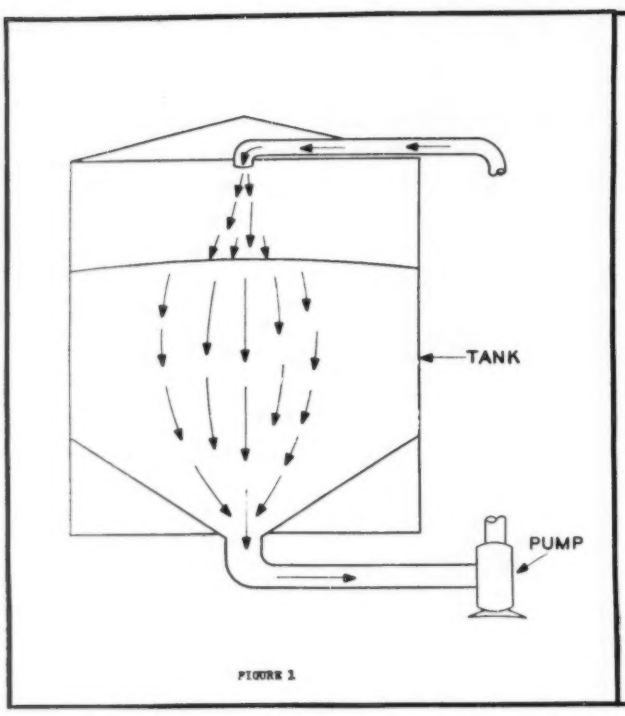



FIGURE 1

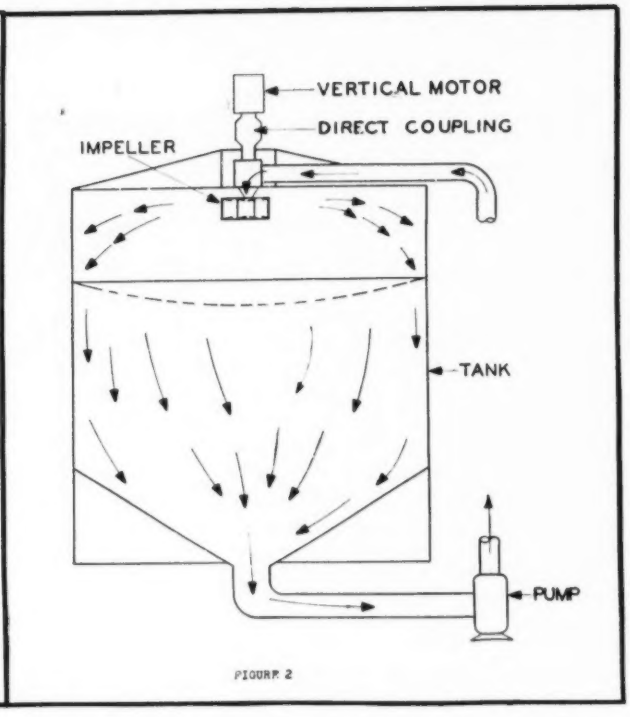



FIGURE 2

**THEORY OF OPERATION**—Figure 1 shows how stock tends to pile up slightly at the point of contact with the stock level already in the chest. This build-up adds sufficient weight at that point to cause a channeling effect in the discharge flow of the stock. Stock next to tank walls tends to stick and form dead pockets. Figure 2 shows how action of Side-Flo impeller throws stock to wall of tank causing build-up there rather than in the center. Flow is thereby established along tank surface, eliminating former pockets.

# Better Circulation In Stock Storage Tanks

**Written by Staff of Minnesota & Ontario Paper Co.**

**Minnesota & Ontario Paper Co. tells how the Side-Flo Unit eliminates dead pockets in the tanks at the International Falls mill.**

The Allis Chalmers Side-Flo tank unit is a vertically mounted pump spreader for installation in the top center of a pulp storage tank. One was originally installed in the International Falls mill on a 30-foot diameter x 48-foot high tank storing bleached sulphite stock at four per cent consistency. The spreader is used in conjunction with a 2000 g.p.m. 70-foot head circulating pump which has its suction on the bottom center of the tank.

## Operation

The circulating pump delivers the stock to the Side-Flo unit which throws it to the walls of the tank. The pulp is spread evenly through 360 degrees and flows down the walls to the bottom of the tank, flowing eventually back to the suction of the circulating pump.

The spreader unit is driven by a 30 hp. motor. The drop between the impeller and the walls is about six inches. The bottom of the tank is sloped ¾ inches per foot from the walls to the suction of the circulating pump. The stock that is drawn out for use is pumped by another pump directly to metering tanks, where it is blended with other pulps to provide the desired machine furnish.

## Consistency Control Needed

In the past, in order to maintain the consistency of the drawn stock, it was necessary to add lap stock to compensate for the fiber that remained in dead pockets in the storage tank. Adding of laps provided good control but was costly. From experience with storage of groundwood pulps, we knew that stock consistency can best be held uniform with large tanks and good mixing.

We discussed our problem with the Allis Chalmers pump engineer, Frank Forrest, and figured that their regular vertical stock pump without the volute

would provide the side-flow action we needed in the tank.

### Judgment of Performance

The performance of this unit has been very good. We can draw the pulp out of the tank with a negligible amount remaining. This is done while maintaining uniform consistency to the hydracycle metering tank. Over week-ends or other shut-downs, we have stopped the circulating system; then, six hours before the stored stock is needed, the system is started up, and it brings the stock to a uniform consistency again.

We have in our mill three pulp storage tanks, each 45-foot diameter x 48-foot high, and five tanks, each 30-foot diameter x 48-foot high. These are used on the following pulps: The 45-foot diameter tanks on natural kraft and one on unbleached groundwood; two 30-foot diameter tanks on bleached kraft, one on bleached groundwood, one on unbleached sulphite, and one on bleached sulphite. These pulps are stored at consistencies ranging from 3.5 per cent to five per cent. We plan to install Side-Flo units on all our pulp storage tanks.

**VERTICAL MOTOR** drives the impeller of the Allis-Chalmers "Side-Flo" unit on top of one of the stock tanks at International Falls.


*"Paper conditioning the modern way"*

# Vapo Systems Co.

## ANNOUNCES

A Large Paper Mill Chain Has Purchased
12 INSTALLATIONS
FOR
10 INDIVIDUAL MILLS

Another Large Mill Chain Purchased
5 INSTALLATIONS

26 Other Outstanding Mills Have Adopted
VAPO SYSTEMS

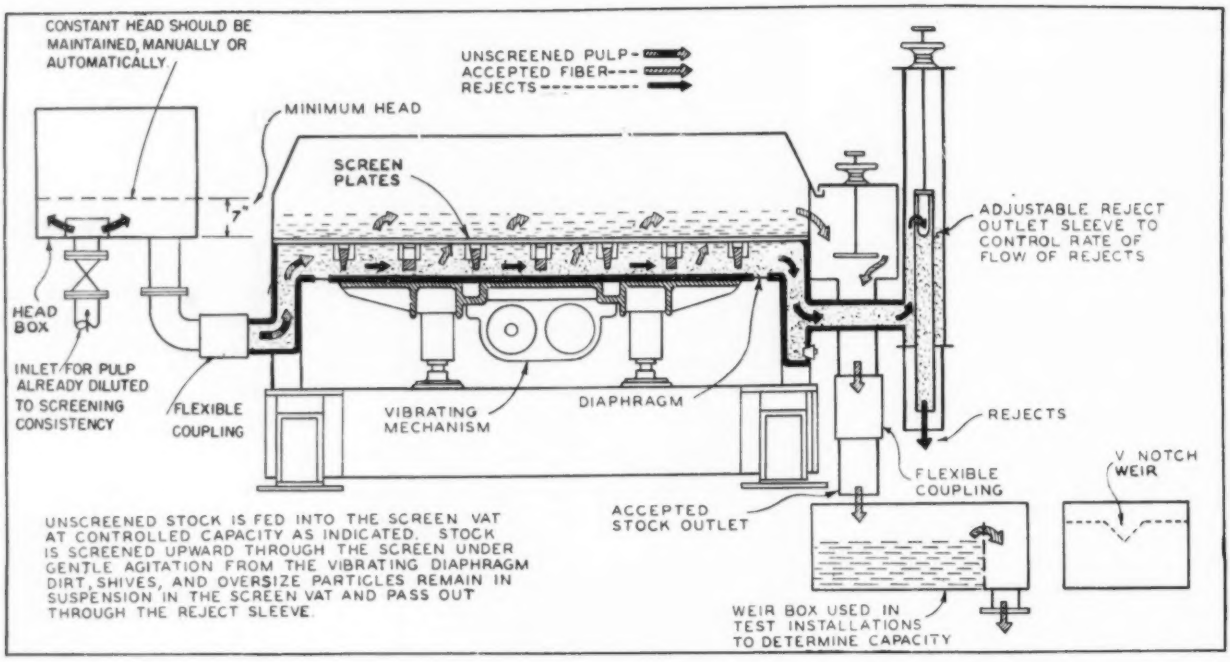
16 Paper Converters—Waxing Plants, Laminators
And Bag Makers Have Adopted Vapo Systems

**YOUR INQUIRIES ARE INVITED**

**VAPO SYSTEMS COMPANY**

**132 W. HOME AVE.** **PH. VILLA PARK 7678**

**VILLA PARK, ILL.**


CONSTANT HEAD SHOULD BE MAINTAINED, MANUALLY OR AUTOMATICALLY
UNSCREENED PULP
ACCEPTED FIBER
REJECTS
MINIMUM HEAD
SCREEN PLATES
7"
ADJUSTABLE REJECT OUTLET SLEEVE TO CONTROL RATE OF FLOW OF REJECTS
HEAD BOX
INLET FOR PULP ALREADY DILUTED TO SCREENING CONSISTENCY
FLEXIBLE COUPLING
VIBRATING MECHANISM
DIAPHRAGM
REJECTS
V NOTCH WEIR
FLEXIBLE COUPLING
ACCEPTED STOCK OUTLET
UNSCREENED STOCK IS FED INTO THE SCREEN VAT AT CONTROLLED CAPACITY AS INDICATED. STOCK IS SCREENED UPWARD THROUGH THE SCREEN UNDER GENTLE AGITATION FROM THE VIBRATING DIAPHRAGM DIRT, SHIVES, AND OVERSIZE PARTICLES REMAIN IN SUSPENSION IN THE SCREEN VAT AND PASS OUT THROUGH THE REJECT SLEEVE.
WEIR BOX USED IN TEST INSTALLATIONS TO DETERMINE CAPACITY

# First Mill Report of Ahlfors Screen Operation On Deinked Pulp

**As told at the mill to the editors of Paper Trade Journal**

**The experience of Newton Falls Paper Mill, Inc. as the first North American mill to screen deinked stock with Oliver Ahlfors screens, should stir considerable interest among pulp men.**

Always alert to new ideas that show real promise of improving their production, the managers of Newton Falls Paper Mill, Inc., Newton Falls, N. Y., recently replaced the former flat screens in their deinking plant with two Oliver Ahlfors screens. It is not known for sure whether this Swedish-type screen has been applied in Europe to deinked pulp, but the Newton Falls units are certainly the first such installations in North America. And the mill men report they are more than satisfied with the performance of the screen.

## Space Saving

The two Ahlfors screens, built by Oliver United Filters, Inc., are each 8-plate units with .012-inch cuts. Without any reduction in capacity, they have replaced two flat screens that were each 48-plate units, also with .012-inch cuts. Considerable square footage in the screening area of the pulp mill has thereby been vacated by this changeover and is now available for the installation of more screens if an increase in capacity is needed.

The two screens operate in parallel and perform the final screening of the deinked pulp. They receive the stock from a single Bird-Jonsson primary screen that removes the large dirt and inorganic material. Rejects from the two Ahlfors pass to an adjustable outlet sleeve that controls the rate of flow of the rejects to an existing flat tailing screen.

Both of the new screens are standard Oliver Ahlfors units employing the principle of screening the stock upward through the plates, the agitation being supplied by a vibrating diaphram. Details of the screen's operation can be seen in the accompanying schematic drawing. The vibrating mechanism is equipped with a 5 hp. variable speed drive.

In the Newton Falls operation, the stock is screened at 1.0 percent consistency, whereas the former flat screens operated at 0.5 to 0.75 percent consistency.

## Cleaner Stock

It is the opinion of production men at Newton Falls that their Ahlfors screens are producing cleaner stock than the former flat screens. This judgment is based on observation of finished paper and not on comparative dirt counts. The mill's finished grades of paper containing deinked stock look cleaner than before. This improvement is important to the company particularly on their 100 percent deinked stock papers.

## More Washing Required

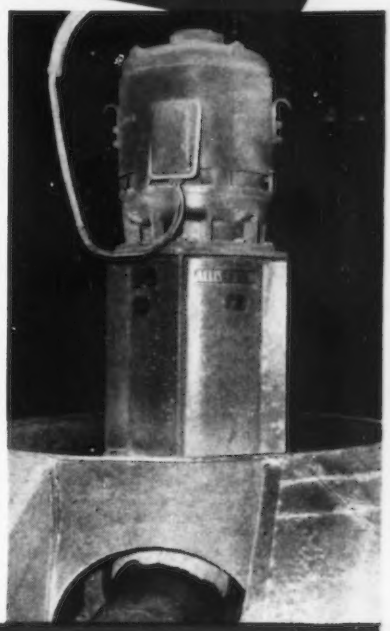
The Ahlfors at Newton Falls require more frequent washing than the former flat screens. Each Ahlfors is shut down once every 24 hours to be cleaned. In spite of this down-time, the new screens maintain a 24-hour capacity equal to the old-type screens. Together, the Ahlfors handle an average of 55 tons a day.

During operation, the Ahlfors are kept clean with oscillating showers. Originally they were equipped with stationary showers, but the oscillating units were found necessary for effective cleaning of the cuts.

# NEW — Side-Flo UNIT

## Uniform Stock Flow Throughout Chest

- Prevents Piling Up on Edges
- Stops Lumping, Drying Out
- Cuts Stock Contamination
- Eliminates Plugging of Pump and Pipe



THE *Side-Flo* unit, made by Allis-Chalmers, greatly improves the distribution of stock entering the chest, prevents the accumulation of dried out stock in pockets and allows the stock to flow out of the chest evenly. The result is higher quality product and less downtime for clearing stoppages or cleaning old stock from the chest.

The *Side-Flo* unit is adaptable to practically any size and shape of chest. It can be installed on old or new chests without major alterations. For information, call your nearby Allis-Chalmers District Office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

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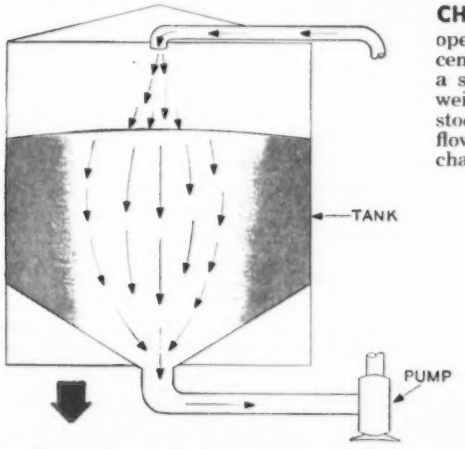
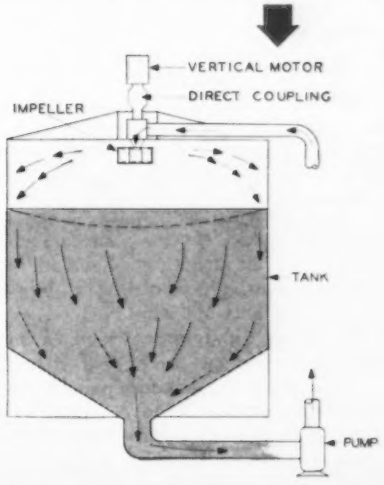



**CHEST WITHOUT A *SIDE-FLO* UNIT** — Where flow is into the center of the stock chest, the stock has a tendency to pile up and add weight to the center. This slight weight increase at the center, coupled with the intake directly below, causes a channeling effect of the stock through the center of the feed chest. Stock at the sides has a tendency to thicken and dry out. When this stock does break loose from the sides, it has reached the stage where it contaminates the final product, and since it breaks off in large lumps, it may clog the pump or pipe.

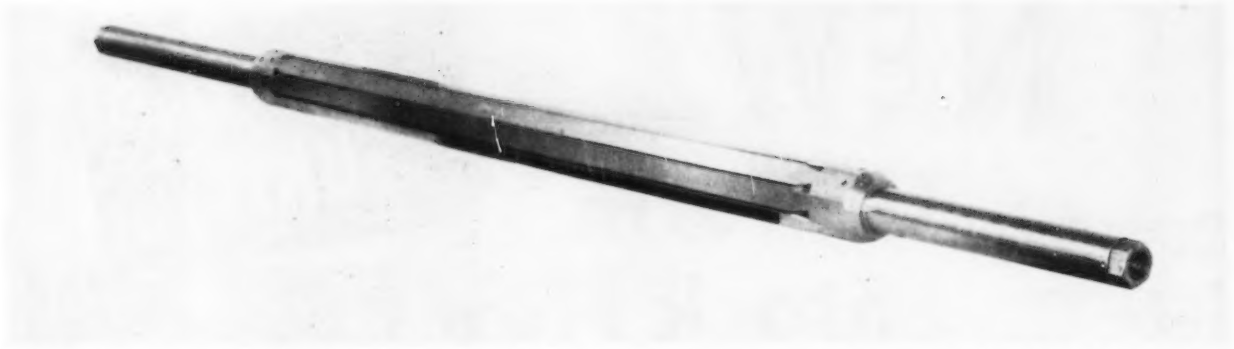
**CHEST WITH *SIDE-FLO* UNIT** — With a *Side-Flo* unit in operation, stock enters the chest through the impeller in the center and is thrown to the outer walls of the chest. This causes a slight buildup around the outer edge of the chest. Added weight causes edge flow to take place, while at the same time, stock in the center of the chest will flow due to the periphery flow and location of the discharge. The overall effect is a discharge from the entire chest cross-section area.




*Side-Flo* is an Allis-Chalmers trademark.

A-C ALLIS-CHALMERS

# ALLIS-CHALMERS



**THE VALVE** in the counter bored end plug of this Aero-Shaft allows compressed air to enter the shaft and expand the ribbed section to grip the inside length of the core.

# Air Loaded Core Shafts Speed Converting Operations In Carthage Mill

**E. W. Zabriskie, Division Industrial Engineer, Crown Zellerbach Corp., Carthage, N. Y., reports six advantages that are offered by air loaded core shafts in handling jumbo rolls in the converting operations of this towel and tissue mill.**

The Carthage Division of Crown Zellerbach Corp. contains a complete converting plant for converting and packaging the towel, toilet, facial, napkin, waxing, and other tissue specialty papers made on the mill's three fourdriniers. Faster and safer handling of roll stock in this converting plant has been accomplished by the use of Aero-Shaft core shafts, according to Division Engineer E. W. Zabriskie.

"In the past, we have used conventional type shafts and plugs for mounting jumbo rolls behind various types of converting equipment," explains Mr. Zabriskie. "The shaft is thrust through the core of the jumbo roll and a cast iron tapered plug is slid along the shaft to engage the core; a man with a sledge hammer strikes the plug several hard blows, to force plug into the roll core. A heavy cap screw is tightened with a hand wrench to lock the tapered plug to the shaft.

"During the past year we have used a number of air loaded core shafts (Aero-Shaft) in our Carthage converting plant operations. Here the shaft is thrust through the core of a jumbo roll and an air hose valve pressed against the air valve on end of shaft thus filling the expandable part of the shaft with a predetermined amount of air. The shafted roll is then ready for use."

## Six Advantages Cited

"These air shafts have the following advantages in our operations," says Zabriskie:

**1**—They eliminate the use of a sledge hammer to drive plugs.

**2**—They remove the hazard of flying particles of iron or steel from driven plugs.

**3**—They eliminate using hand wrench to tighten cup screw on plug.

**4**—They eliminate gouging and wearing away of shafts from cap screw pressure.

**5**—They extend core life by eliminating splits and gouges that used to occur when tapered plugs were forced into the core.

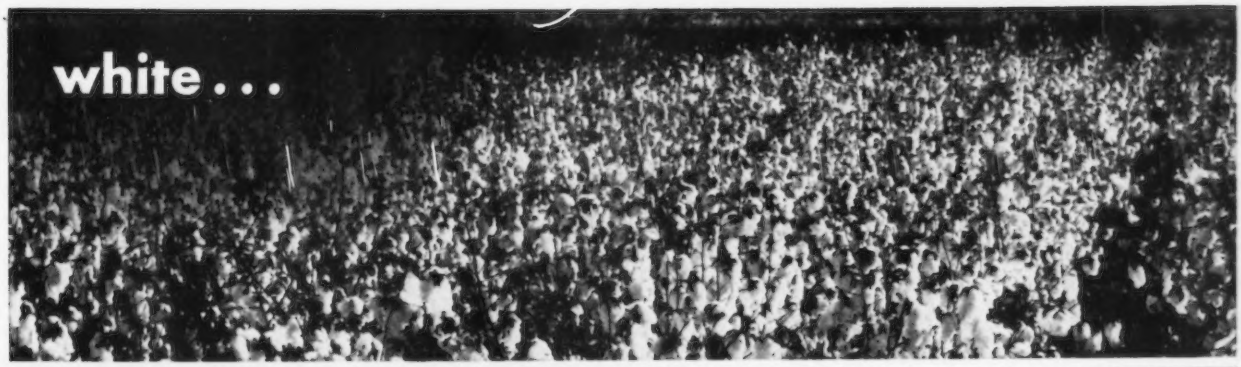
**6**—They also eliminate the need to purchase cast iron tapered plugs.

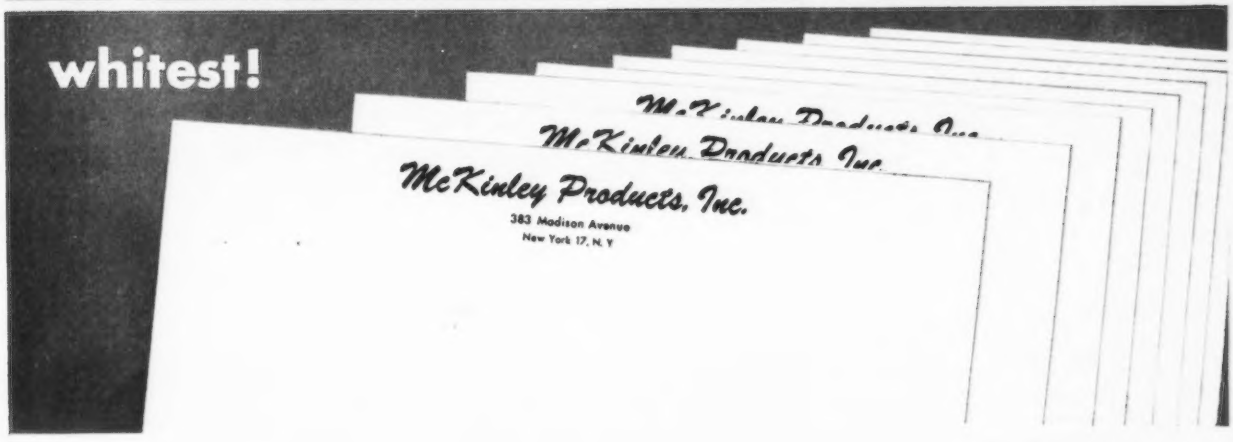
"We have additional air loaded core shafts on order presently as a part of our equipment modernization program."

## How They Operate

Made by Paper Converting Machine Co., the Aero-Shaft consists of a 2-inch O.D., 1-inch I.D. steel tube the length of the shaft. Drawn over this steel tube is a neoprene rubber tube held at each end with two hose clamps. A set of eight spring steel ribs is held in place by steel end collars having dovetail slots. Air is introduced to the shaft through an ordinary automotive-type air valve mounted in the steel counter bored end plug. The 15 edges of the spring steel ribs are made to grip the full inside length of the core.

For use with 3-inch I.D. standard cores in web widths from 10 inches to 80 inches, these shafts are made with a single set of ribs for widths up to 40 inches and with a double set of ribs with a center collar for widths over 40 inches.






## NEW Du Pont Paper White BN will make your paper whiter than words — or pictures — can say

You'll have to see it to believe it—a dye that makes paper so white that most of today's papers look dull and gray by comparison!

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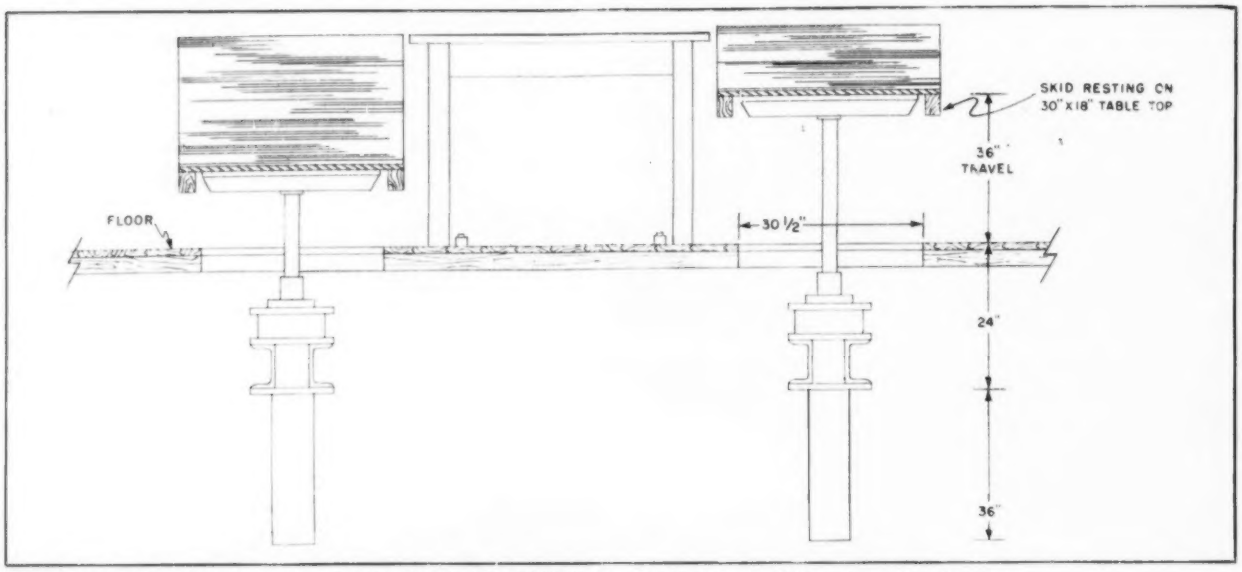



**LEVELING ACTION OF A PAIR OF BENCHEVATORS** is illustrated in this schematic drawing.

# Benchevators Permit Faster Sheet Inspection At Parsons Paper Co.

Inspection of sheet stock at Parsons Paper Co. has been speeded up an estimated 20 percent since a new type of materials handling device was installed for bench level presentation of the skid stacks of paper. The device is known as the Benchevator, a product of Rodney Hunt Machine Co.

## Simple Design

Constructed especially for leveling skid loads of any sheet stock, this work-positioner can handle up to 5000 pounds of material. It consists of a motor-driven, self-locking, screw-actuated column with a table top. The top can be made any desired size to handle various kinds of work.

## Persons' Units

At the Parsons Paper Co. the Units are installed in a row in pairs, one to handle incoming skids of paper and the other to receive inspected sheets. The top of the machine is raised or lowered to the most convenient height as the work proceeds. The standard lifting or lowering speed is 28 inches per minute. The maximum lift distance is 36 inches.

Push button control stations, suspended within reach of each operator, actuate the positive gear drive for each Benchevator. The buttons can also be installed as foot controls, and it is true also that a pair of Benchevators can be controlled individually or synchronously.

## Improvements Accomplished

As a result of installing the units, people at Parsons report that twelve women are now able to work from full skid stacks of paper (1200 to 2500 pounds) instead of the former 50 to 100 pound lots.

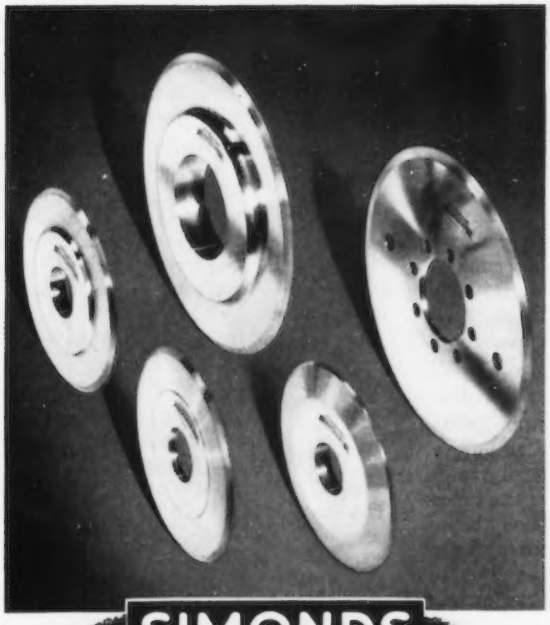
It is further reported that formerly three men were required to keep the inspectors supplied with work. Now, one man operating a lift truck handles the loaded skids for all the inspectors. Spoilage has been reduced by eliminating this extra handling.

George Turner, superintendent of the finishing department at Parsons, is quoted as saying, "I would hate to go back to the old method. This Rodney Hunt equipment does a much better job for us, and presents no maintenance problem."

**FINISHING ROOM OF PARSON'S PAPER CO.** A pair of Benchevators for each inspector enables her to work from full skids and still maintain the height of the paper stacks at bench level.

SIMONDS FORGES THE STEEL

to make the cutting edge last



Experience proves "Red Streak" Forged Slitters maintain a smooth cutting edge longer than slitters made by any other method. Note the dense and uniform Simonds steel grain structure around the slitter rim. It's tougher, harder — won't flatten out or chip when operating against hardened steel rolls.

Scientifically heat-treated to just the right combination of hardness and toughness . . . precision ground to perfect roundness and close hole tolerances to fit standard holders . . . Simonds Forged Slitters give you the *smoothest, most dependable* cutting at lowest cost. Ask your Simonds Industrial Supply Distributor about "Red Streak" Forged Slitters with the longer lasting cutting edge.

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*Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada*

# "Red Streak" SLITTERS

# Successful Measurement & Evaluation of Slime at St. Lawrence by the Mc Keown Tester

**John H. Bardsley**
P. Eng., Superintendent, Technical Services,
St. Lawrence Corp. Ltd., Three Rivers, Que.

## Introduction

St. Lawrence Corp., Three Rivers Mill, Que., manufacturer of newsprint, has been using very active slime control for over ten years at costs varying from a few cents to over fifty cents per ton, on experimental occasions. On the basis of a production of 670 tons per day, this cost ran from $30 to over $335 per day. At these expenditures we have, of course, tried many ways to control our treatment costs. Among those used have been test panels suspended in the system; bacteria plate counts from various places throughout the system; test panels suspended in slime measuring units which periodically were taken out and the deposits measured by weighing, by volume, or by centrifuging; examination of the system on shut downs; cataloguing of wet end breaks; and finally, by use of the McKeown Tester, a transparent slime measuring unit. I mention the above to emphasize that we have had considerable experience with slime control.

Slime may be objectionable from two points of view: either because it affects the quality of the product, or beacuse it causes loss in the production. In the manufacture of specialties, slime faults cause complete culling, degrading, or if they slip through, customer complaints. In the manufacture of tonnage papers, such as newsprint, slime causes breaks which result in lost production. Whether slime is a problem either from the point of view of quality or production, it amounts to a very real and large cost to a paper mill, and satisfactory control methods will pay off.

## Nature of Slime

Slime troubles usually signify the presence of troublesome bacteria or fungi in the system, but, as a matter of fact, so-called slime troubles may be the result not only of bacterial or fungal deposits, but also of chemical deposits, lumps or pulp, or deposits of silt, dirt, dried pulp, or scale.

The major expense in common slime control is in the dosing of the system with various micro-organism restraining chemicals. What chemicals, when, and how much become questions of great importance. Any indications that will allow a clearer decision become important. Buckman Laboratories with their "Bulab Stain" contributed a method of distinguishing between micro-organism deposits and the others, but this does not tell the quantity or type of deposit.

Slime troubles in a pulp and paper mill are the result of the type of deposit as much as the quantity or thickness. A thick tenaceous layer causes no trouble and may actually be a blessing, for it protects the equipment and may keep out system dirt. It doesn't matter how many bacteria or fungi there are present in the system, or even what types or organisms they are. What does matter is what type of deposit they form.

## Former Approach Not Adequate

For many years we have used test panels supported in various types of flow boxes. It has been our toutine practice to remove these panels at stated intervals and estimate the quantity and type of deposit building up. We have tried measuring the weight per area, and the volume per area, and developed a method by which we could estimate the quantity of total deposit as well as the quantity of slime deposited. However, even here we were unable to evaluate the troublesomeness of the deposit.

Slime on the surface of the system may take many forms. It may be a relatively thick rubbery or pasty deposit varying from one-sixteenth to over a quarter of an inch in thickness. If no actual mechanical scraping is done in the system this deposit will cause no operating difficulty, even though when measured it appears as a large quantity. On the other hand, the deposit may be very loosely attached, but have pseudopodia-like attachments which extend into the stream like small barrage balloons, and when they break off they cause holes marks, or breaks in the sheet. Generally, these pseudopodia-like strings cannot be seen or distinguished once the liquid is removed from the surface such as by draining. When the liquid level is lowered, these strings fall against the walls where the surface tension pulls them right into the main deposit and at the same time causes the whole mass to contract. This is very similar to the way a person's hair clings to the scalp on coming out of water. During the draining, some of the deposit may sluff off, leaving thin or completely clean areas. The drained surface thereby takes on an entirely different appearance and aspect, which leads to false impressions as to the seriousness of the deposit.

Conclusions reached from the drained state are therefore likely to be erroneous. A more realistic conclusion requires examination of the surface while in solution, and if possible without disturbance. To do this the McKeown Transparent Slime Measuring Unit was developed. The method of evaluation we use is adapted to this unit and is the result of many years' development. This method follows.

## How McKeown Unit Works

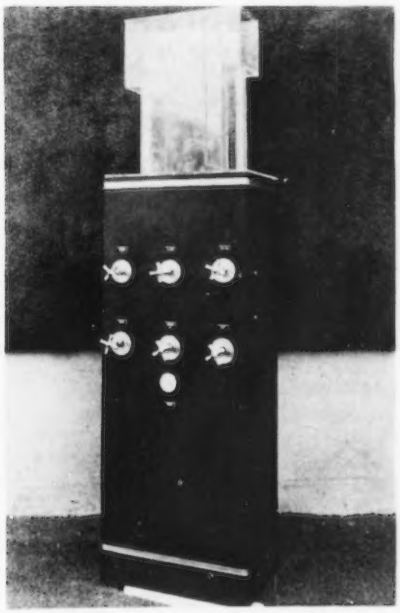
The unit consists of a clear transparent plastic flow box in which the test panels are suspended. This is mounted on a pedestal housing the piping and valves. Six valve handles project through the front paneling by which the operation of the unit is controlled. The whole unit makes a very neat and impressive installation.

Our method of use is as follows: concrete test panels 13″ x 5″ x 1″ thick are suspended from a rod across the top of the flow box. The concrete panels may be exposed for the day, for the week or for any convenient period. We normally sterilize the concrete boards in an autoclave before they are put in, and we put a new panel in each day. Sometimes a board is put in for the whole week. We then turn on the flow from the mill system. In our case, we use both the stock that feeds the head box or the white water from either the wire pit or suction boxes. At any time when the condition of the system requires appraising, the system water is turned off from the measuring unit, and clear water of the same temperature as the system is run into the unit. The clear water soon replaces the system allowing the deposit on the panel to be visually examined in place. The thickness, the quantity, and the type of slime may be seen in perfect detail and proper corrective measures taken.

### Unlimited Checks Possible

After the examination is made, the system water may be again substituted for the clear water, without disturbance, and the exposure continued. The observations may be made any number of times without disturbing the physical characteristics of the deposit thus allowing any number of checks or re-examinations to be made. The actual amount may be determined as follows:

After substitution of the system water by the clear water, the panel is carefully removed in such a way that the deposit on one side does not sluff off into the water. This requires careful manipulation, but by tilting the board, only the underside and edges may be lost. The deposit on the one side is then scraped off into a suitable container by means of a plastic spatula. The quantity of water with the deposit does not matter. Any part of the area that is lost or has sluffed off is proportionally corrected in the quantity determination.



**TRANSPARENT FLOW BOX** on top of the piping and valve housing of this McKeown Tester permits direct visual observation of suspended test panels, on which slime from the mill system is made to accumulate.

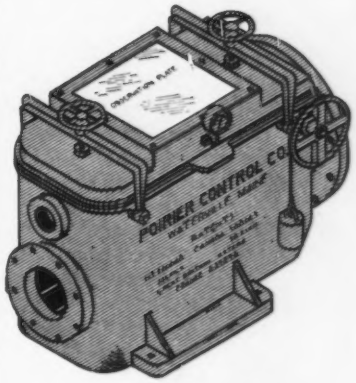
### Isolating the Slime

The scrapings are then diluted to 90 ml., and after mixing a 15 ml. aliquot of this is placed in a 15 ml. centrifuge tube. The rest, 75 ml., are then diluted to about 1000 ml. and afterward are screened through a piece of 60/40 fourdrinier wire. The material remaining on the wire is assumed to be slime and is collected, placed in another 15 ml. centrifuge tube and made up to 15 ml. These are then centrifuged. After centrifuging, the volume of deposit in the bottom of the tubes is taken as total deposit and slime. The total deposit is calculated by multiplying its centrifuge volume by 6, while the total slime is obtained by multiplying its centriguge volume by 12. The slime index is obtained by dividing these figures by the area of the board in square feet to give ml. per square foot.

### Evaluating Controls

The preceding has dealt with the routine evaluation and control of slime. There are, however, other important uses we at St. Lawrence have developed. One is the evaluation of slime controlling chemicals or techniques. The efficiency of a submitted slimicide may be determined by direct treatment of the stock flowing through the transparent box using various concentrations or dosages of the chemical under test. (If a chemical shows possibilities, we can reach a concentration at which growth may be inhibited.) The direct effect on the deposit build-up may be seen, and a quick reliable evaluation made. Another is to evaluate the anti-sliming tendencies of various surface materials and anti-fouling paints. And still another is the evaluation of methods of treating, washing, or anti-slime spray treatment of various surfaces. In the testing of surfaces or surface treatment, samples of these surfaces are exposed along side standard surfaces, and direct visual comparison is made.

We have found that the evaluation of slime in a paper mill system requires actual visual evaluation which may be obtained by use of the McKeown Slime Measuring Unit which we have found very suitable for this purpose.

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This trouble-free, fool proof system functions, regardless of stock weight or grade, in accordance with the porosity of the sheet. It automatically provides the correct amount of vacuum in each suction box in one operation, and makes possible increased machine speeds up to 30%. Increased wire life, decreased cover wear, and power savings are also yours.

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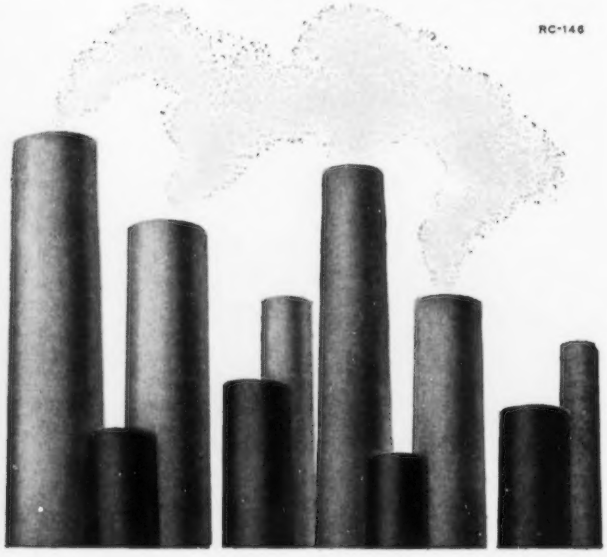
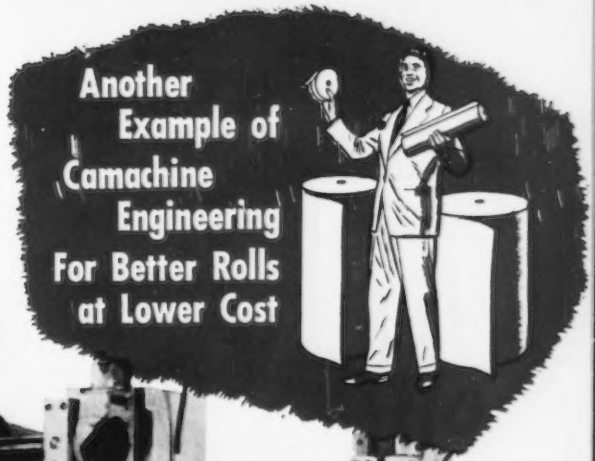
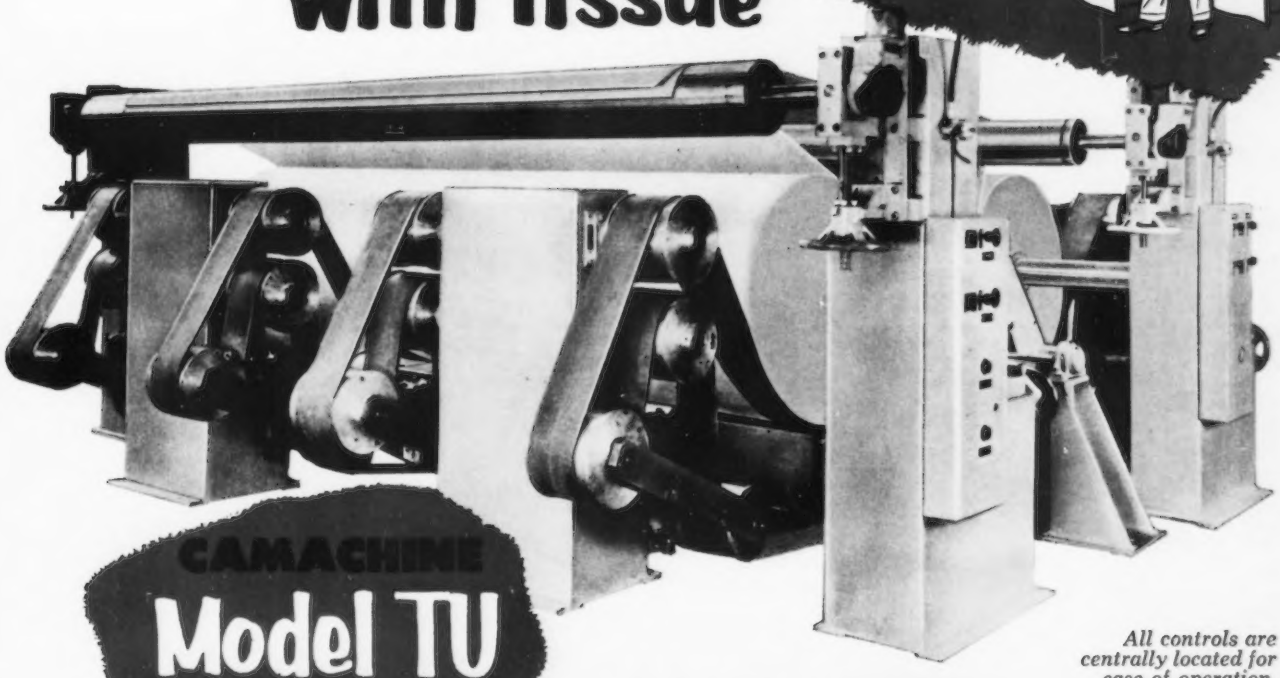


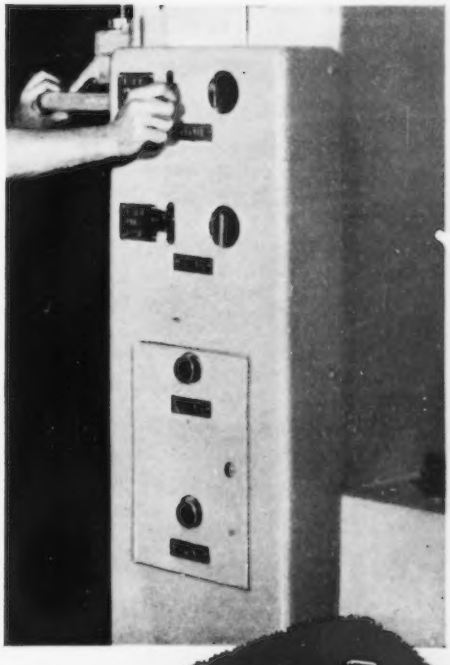
# gentle with tissue



## CAMACHINE Model TU DOUBLE SURFACE UNWIND

*All controls are centrally located for ease of operation.*



**MODEL TU** unwinds two tissue mill rolls simultaneously, combining them to make two-ply web at speeds up to 3500 fpm. Mill rolls are surface-driven by the gentle, positive contact of rubber-impregnated endless woven belts, selected for long wear.

**Positive pay-off** of the webs, even with out-of-round mill rolls, is assured through a combination of design features. For example: tension control, to minimize stretch and eliminate "snap-offs", is maintained from 0 and up through the adjustable variable speed drive. Mill roll faults, such as "baggy ends" or misalignment, are corrected through vertically adjustable compensating rolls and horizontally adjustable self-aligning reel bar bearings.

**Additional features** include the centralized push-button control station; pneumatic operation of the reel bar latches; automatic reel bar ejection to reduce downtime; and provisions for disengaging the back section when running single-ply tissue. Installation is at floor level with no pits or holes required to accommodate the drive belts.

**In every respect** the Model TU assures the high standards of dependability which are demanded in continuous paper mill service... *Follow Camachine Engineering!*

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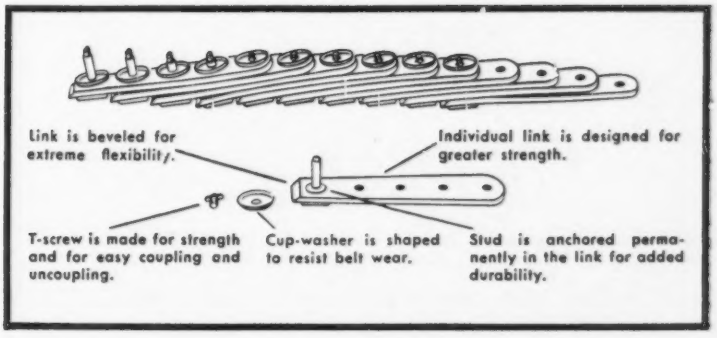
This detailed line drawing of the new Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job... easier!


Link is beveled for extreme flexibility.
Individual link is designed for greater strength.
T-screw is made for strength and for easy coupling and uncoupling.
Cup-washer is shaped to resist belt wear.
Stud is anchored permanently in the link for added durability.

# New VEELOS

## TD and TE Adjustable V-Belt for D and E drives

### ▶ *easy to couple and install*

### ▶ *does a better job for a longer time*

THE NEW VEELOS TD AND TE adjustable v-belt was developed *specifically* for D and E drives. It's not just an adaptation, it's an entirely new patented v-belt design!

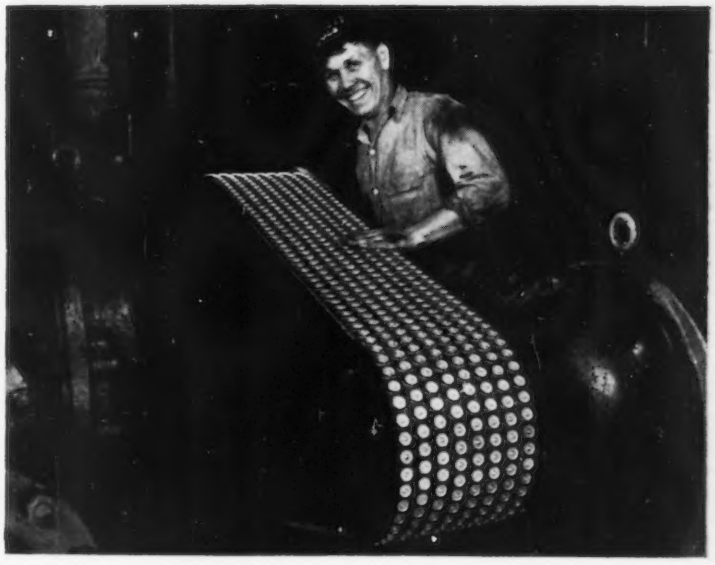
*New Veelos TD and TE v-belt is faster* and *easier* to install. Cup-washers and T-screws join links together to make up individual belts—and you don't need to remove outboard bearings.

*New Veelos TD and TE v-belt lasts longer.* Advanced construction of stud, cup-washer and T-screw provides added strength and durability—protects the new high-tensile strength link.

*New Veelos TD and TE v-belt is perfectly balanced.* Machine-cut sides and uniform links provide smooth, vibrationless, full-power delivery.

Put the new Veelos TD and TE v-belt on your D and E drives . . . prove to yourself that this v-belt does a better job for a longer time!

Get the complete story of this great, new v-belt. Send coupon for new 8-page illustrated bulletin.



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Veelos is known as Veelink outside the United States.

**ADJUSTABLE TO ANY LENGTH** **ADAPTABLE TO ANY DRIVE**

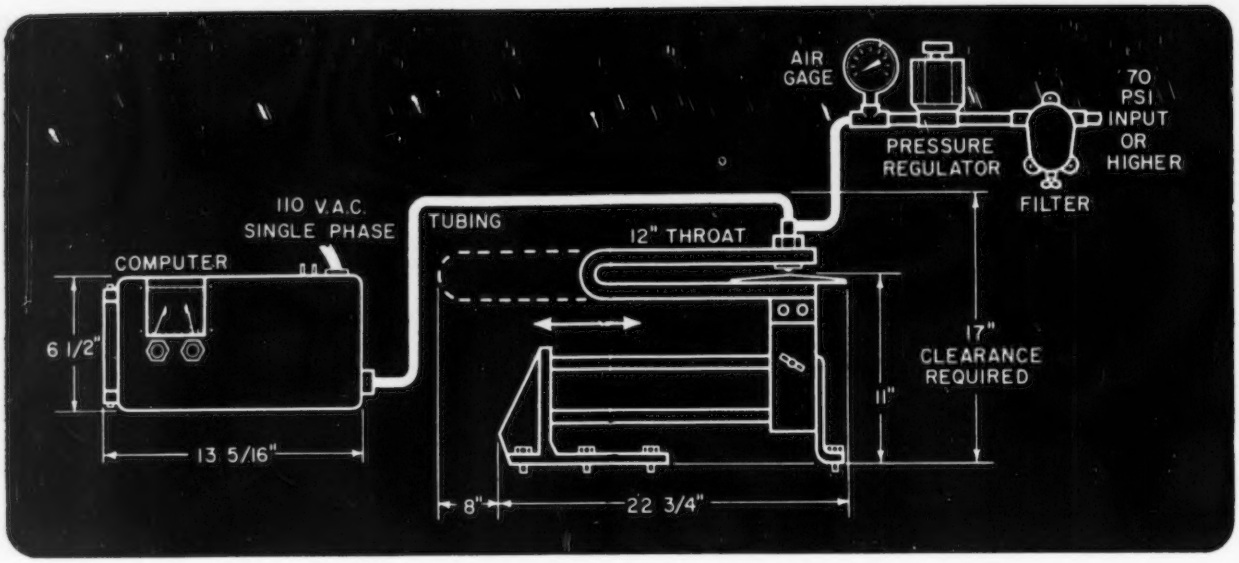



**FIGURE 1—TYPICAL LAYOUT OF THE COMPONENTS OF THE AEROSENSOR.** The web of material being gauged passes between the arms of the 12-inch "U"-shaped throat.

# Continual Recording of Comparative Paper Caliper By Air Gauging

**A. B. Daniels**

L. L. Brown Paper Co., Adams, Mass.

Like many other paper manufacturers, we at L. L. Brown had been looking for a reliable means of recording the paper web weight variations on our paper machines. Such a record would allow the machine tender to take corrective steps to minimize these variations. It would also help us pinpoint the various causes of these conditions so that they might be remedied. We experimented with methods of accomplishing this without success.

Late in 1952, representatives of Roanwell Corp., Brooklyn, N. Y., showed us their Aerosensor. This instrument was designed to use air pressure to make a continuous comparative record of the thickness variations of material passing through it — recording deviations down to five millionths of an inch, if desired. We had little knowledge of comparative bulk and weight variations and no accurate means of obtaining such information as it would apply to the operation of a paper machine. In January 1953, we installed an Aerosensor, on one of our machines, and later that year purchased the unit. We are pleased with the results.

The Aerosensor measuring system is designed to give a realistic indication of average thickness. This feature eliminates the random effects of roughness such as thick and thin spots in paper. This averaging feature is essential in judging machine operation in the production of rough surface materials to close thickness tolerances.

## How It Works

In the continuous comparative measurement of web thickness of our papers, a twelve inch long "U" shaped piece of metal is mounted on a base so that the paper web passes through it. The base allows the "U" casting to be slid in or out over the edge of the paper to adjust for various web widths or for threading a new web. A small anvil is mounted inside the end of one arm of the "U" casting, and an air nozzle is mounted on the other arm end, directing the air jet toward the anvil. The paper web passes over the anvil thereby reducing the space between it and the nozzle to an amount depending on the thickness of the web. A small volume of at least 70 p.s.i. air is supplied to the unit. This air is filtered and reduced accurately to 50 p.s.i. before entering the nozzle. Changes in the thickness of the paper web passing between the anvil and the nozzle cause a variable restriction in the flow of the air from the nozzle creating a pressure change in a back pressure line which originates in the nozzle. The air pressure in this line, which connects the sensing nozzle to a conveniently located recording unit, activates an arm, one end of which controls the stylus. Adjustable counter weights are set on other end of arm. (See *Figure 1.*)

## Simple Adjustments

A "T" screw, with a fine thread, is located at the curved end of the "U" casting, which is convenient to the operator. This screw controls the opening be-

tween the anvil and the air sensing nozzle. The stylus location, on the chart, may be set at any desired place by changing this screw setting, by moving the counter weights on the balance arm, or both. In practice, we have eliminated the moving of the counter weights and, although we produce papers having great bulk differences, all Aerosensor adjustments are made with the "T" screw alone. Small, final adjustments also can be accurately accomplished by slight changes in air supply pressure at the nozzle.

In order to get a straight line type chart record, without reducing the desired sensitivity, it might be necessary to dampen the activity of the stylus by developing an air reservoir in the back pressure line between the sensing nozzle and the recording unit, of sufficient size to obtain the effects required. We have a 38-foot, 9-inch length of ¼-inch hose connecting the two units and connected also into a 50-inch piece of 1½-inch pipe located vertically under the recorder. The pipe also acts as a trap to collect any condensate which might develop. This gives us a total back pressure reservoir of 180 cubic inches. Without this reservoir the recording is a wide record, varying in width according to bulk variations, which represents the multitude of minute bulk differences being measured.

We have mounted the "U" casting, with sensing gauge, on the dry end of the paper machine dryers so that the paper is measured before being tub sized or calendered. It is necessary to have sufficient tension on the web to prevent it from fluttering as it passes through the sensing gauge. The increased stiffness, of heavier papers, requires more tension on the web to hold it tight against the anvil. (See *Figure 2.*)

## Weight/Caliper Ratio Found

The weights of our papers are based on pounds per five hundred sheets 17 inches x 22 inches, and we have found that the average uncalendered bulk difference per pound is .0002 inches. This difference is reduced in the lighter weights and increased in the heavier weights. The finding of a comparable rough bulk change with weight change allows us to rely on the Aerosensor with a reasonable degree of dependency. When starting up, we obtain weight samples across the web, and the Aerosensor stylus is set on the chart relative to its center, inasmuch as the front side sample weight corresponds to the exact weight desired. The chart is 2 inches wide and divided into ten 0.2-inch sections each of which is sub-divided into five fine divisions. Our unit is calibrated to record .002 inches across the full width of the chart; hence, one pound difference is equal to one 0.2-inch section, and the full chart allows for a ten pound change.

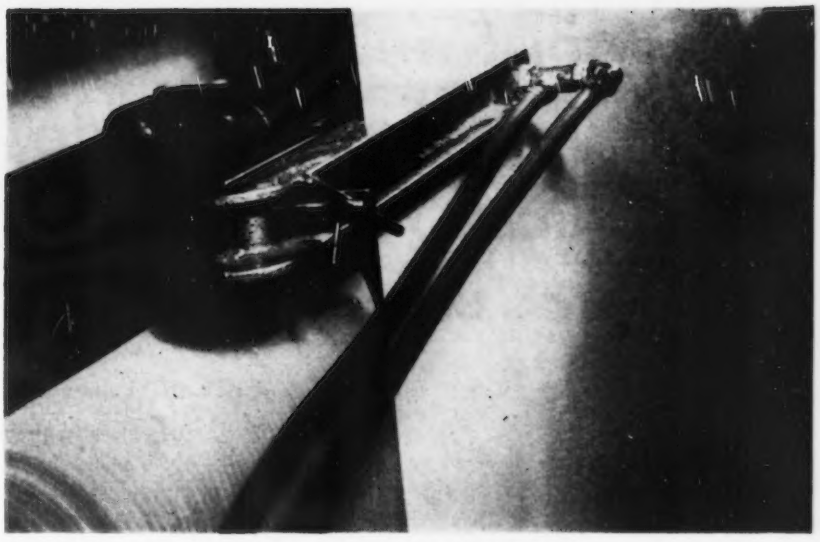


**FIGURE 2—THE "U"-SHAPED SENSING ELEMENT** is mounted on a vertically running web on the L. L. Brown Co. machine. It is equally adaptable to horizontal webs.

The chart on our recording unit travels at a little over six inches per hour, and by setting a Brush Equipment Co. chart reel 30 inches below the recording point, we have five hours of machine operation in view. (See *Figure 3.*)

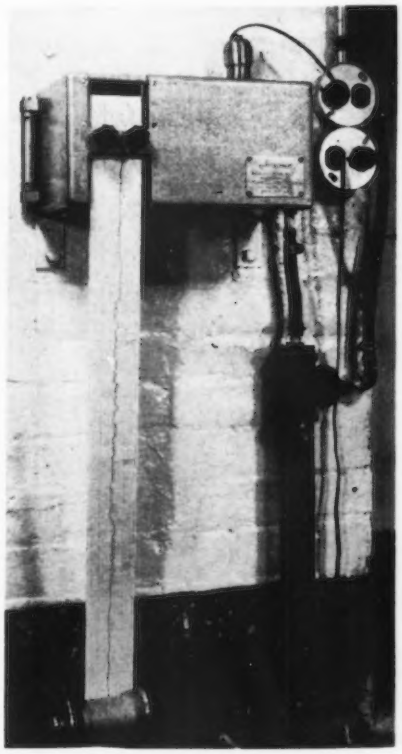


**FIGURE 3—THE ADDITION OF A CHART REEL TO THE AEROSENSOR COMPUTER** enables L. L. Brown Co. to keep in view five hours of thickness recording.

## Operator's Attention Needed

It must be remembered that the Aerosensor is measuring bulk, not weight variations. Many things can change the bulk without affecting the weight and so this equipment needs the cooperation of the operator to be fully useful. Pronounced changes in wet pressures, fiber length, and formation changes will show on the Aerosensor, and the stylus must be reset to adjust for such changes when they take place. Whenever paper receives a final finish on the paper machine, the Aerosensor should give particularly valuable service measuring the calendered web.

## Mill's Judgment of the Unit

The Aerosensor is a compact, rugged piece of equipment which does not have to be handled with kid gloves. Its working parts are simple and require a minimum of maintenance. Critical parts of the equipment are made of Invar, a hard nickle alloy with an expansion coefficient of zero. This is to prevent pronounced temperature changes from affecting its recording accuracy. An air supply and a 110 volt line are all that is needed to install it. Compared to many other web measuring apparatus its price is low. Variations of low moisture content, in the web, do not affect the bulk measurement.

We did not intend the Aerosensor to contribute to any increase in our production, but it has been useful in showing machine conditions we did not know existed. It has also immediately indicated weight variations which otherwise could have gone unnoticed and it is playing a part in our efforts to supply our customers with a better product.

# How Moisture Content is Automatically Controlled by the Stickle Mechanical System

**Stickle Pres-Ten-Trol units on the two paper machines at Newton Falls Paper Mill are taking the guess work out of regulating steam flow to the dryers.**

The Stickle Pres-Ten-Trol is a combination mechanical and pneumatic system for maintaining the desired moisture content in any type of paper or paperboard. Two of these units were installed about six months ago on the paper machines at Newton Falls Paper Mill, Inc. Engineers of the company have told *Paper Trade JOURNAL's* reporter that the controls have already proven their worth.

The control system is made up of three components: (1) a tension roll assembly, (2) a controlling instrument panel, and (3) a diaphram motor valve. A 24-hour chart provides a record of steam pressure in dryers, moisture variation in the sheet, and the time and duration of wet and breaks.

The Newton Falls mill is able to check the effectiveness of the system's control over moisture content, by consulting an independent chart recording of the moisture content furnished by Hygrotester instruments, with which both machines are also equipped.

## Close Control

It is the aim of the mill to maintain a moisture content in the sheet of 5.5 percent. Sample Hygrotester chart records indicate that the Strickle system accomplishes this aim within plus or minus 0.5 percent on the average. In general, control is firmer on heavier sheets than on lighter ones. The grade weights of Newton Falls papers range from 38-pound to 110 pound. The Number One 110-inch fourdrinier runs at speeds from 300 to 700 f.p.m., and Number Two 93-inch fourdrinier runs from 300 to 500 f.p.m.

## Specific Records

Before - and - after records of specific runs tell the story. Last August, before the Stickle control was installed on Number One machine, the moisture-content during a run of 50-pound paper fluctuated between 5.0 percent and 7.5 percent. Following a break on the machine, the moisture content did not settle down again for four hours.

A recent run of 61-pound envelope on the same machine was held by the Stickle unit to within 0.5 percent of the aim. Following a break on this run, the moisture content was back in control in half an hour.

The Stickle unit on the Number Two machine maintained a much smoother curve on a run of 71-pound vellum than was maintained on a similar run before the control was installed.

## Collateral Advantages

People at Newton Falls say that the unit has produced a number of benefits:

**1**—Aside from the desirable sharper control of moisture content, the unit has eliminated time consuming hand adjustment of steam flow to the dryers.

**2**—It has reduced complaints from the mill's customers on the score of moisture variation.

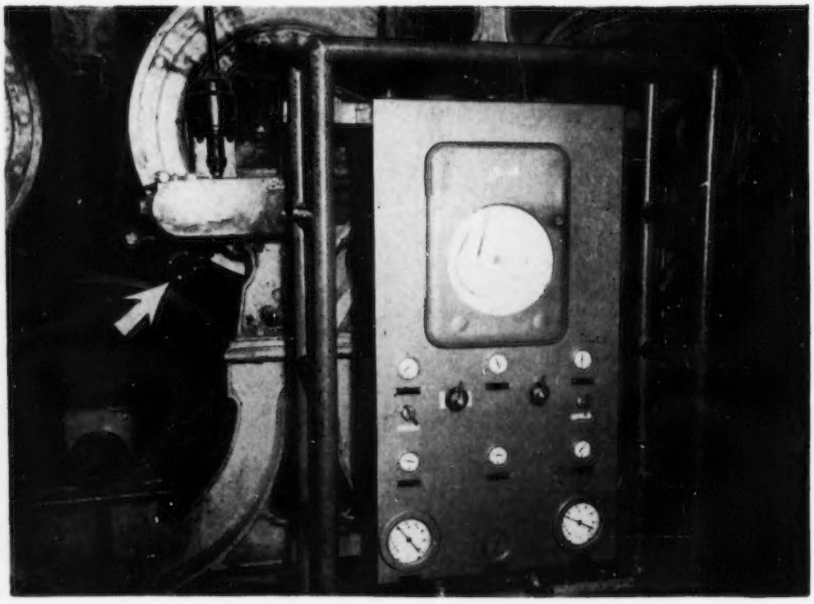
**3**—It seems logical also that a saving in steam consumption has been accomplished.

The system holds adjustment well and requires very little maintenance.

## How the Unit Operates

### Tension Phase

Tension phase of the system operates from variation in moisture content of the sheet as indicated by the draw on the sheet as it passes over the dryers. The slightest change in the draw actuates a floating tension roll connected to a pilot valve. The pilot valve opens or



**TENSION ROLL OF THE PRES-TEN-TROL UNIT** is mounted across the dryer frame below the roll adjustment assembly (see arrow). Instrument panel is at the right.

closes the steam valve to increase or decrease steam flow to the dryers.

The tension roll is installed at a strategic point in the dryer section where the sheet normally begins to tighten and the surface is firm to the touch. Here the paper has the greatest lineal expansion and contraction due to a change in composition of its fiber structure. A slight change in moisture content at this point acts quickly on the tension roll.

When the paper is at the desired moisture content, the control is air loaded so that the roll force against the paper equals the draw force of the paper against the roll. The pilot valve arm is in balance in a manner similar to a balanced scale beam.

As the sheet becomes drier, the draw tightens and the flow of steam to the dryers is retarded to decrease rate of drying. As the sheet becomes damp, the draw slackens, and steam is admitted to the dryers to increase rate of drying.

#### Pressure Phase

When tension and pressure phases of the system are synchronized in dual operation, the pressure phase overcomes the tendency of the sensitive tension phase to over-regulate. Violent fluctuation in steam flow to the dryers is prevented by the pressure control which will not allow the steam pressure in the dryers to rise above or fall below the present limits.

By means of an adjustable throttling band located in the instrument panel, the Pres-Ten-Trol may be set to maintain steam pressure in the dryers at any desired range—from .05% to 30% plus or minus the pressure selected.

Example: If experience has shown that proper drying of a certain weight and grade of paper requires a steam pressure between 9 and 11 pounds, the Pres-Ten-Trol would be set up in this manner. Pressure would be set at the average pressure desired—or 10 pounds. Throttling bands would then be set at 10 percent—to give a one pound variation above and one pound variation below this pressure.

Thereafter, the Pres-Ten-Trol will regulate steam flow to maintain steam pressure in the dryers between 9 and 11 pounds, as required by moisture content of the sheet passing over the dryers.

Thus, momentary variations in weight of the sheet or speed of the machine will not cause violent fluctuations in steam flow, and upset normal drying rate.

The dryer sections of both Newton Falls machines are divided into two separate parts and each of the four parts has a Pres-Ten-Trol unit. However, only the controls on the first part of each machine are synchronized in the dual operation described above.


# THERE'S MORE TO THIS THAN MEETS THE EYE

## CHIEF SANDUSKY

**CENTRIFUGAL NON-FERROUS CASTINGS FOR ROLL SHELLS, COVERS, and LINERS**

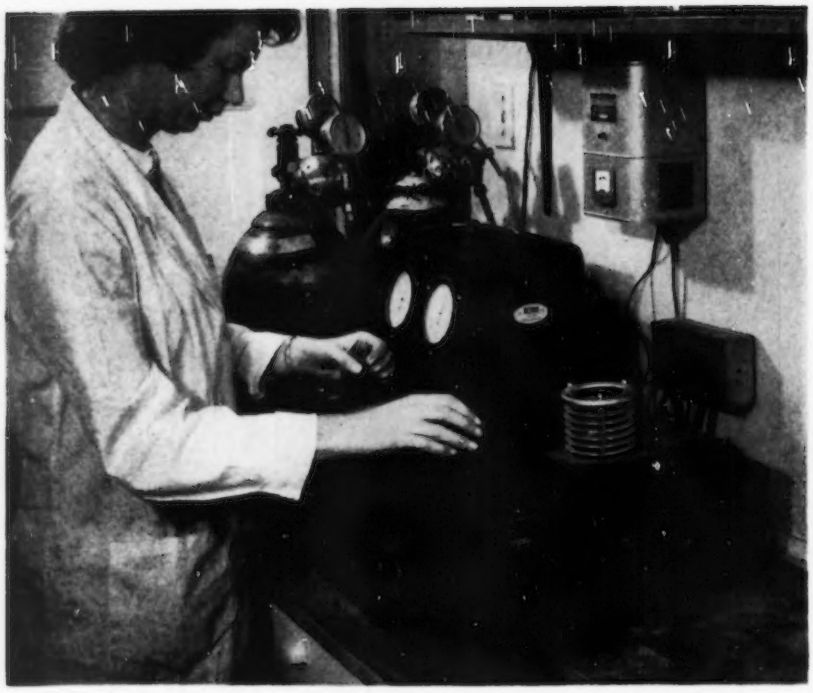
Into every furnace charge go a variety of ingredients of known quality and composition. And everyday "ingredients" like these—constant research leading to improvements, a wealth of experience carefully analyzed and correctly applied, rigid controls, advanced techniques—have earned and maintained Chief Sandusky's leadership in non-ferrous centrifugal castings since 1907.

Chief Sandusky offers unequalled service to the builders and users of paper mill machinery through the use of its non-ferrous cylindrical castings for roll shells, covers, and liners. Research specialists inside the company and on assignment are constantly studying the metallurgical problems of machine builders and users—so that they can come up with the right, the practical answers.

Better production demands the finest component parts in machines. Always specify "Chief Sandusky" to your machine builder and get the best.

**SANDUSKY FOUNDRY and MACHINE CO.**

615 W. Market Street Sandusky, Ohio



In continuous operation, this **MODEL DU SPECTROPHOTOMETER** with flame photometry attachment analyses samples at the rate of two a minute. The atomizer burner utilizes acetylene and oxygen and aspirates the sample directly into the hot flame.

# Faster Method of Analysis Saves Kraft Chemicals at Canadian K. V. P.[1]

Favorable economics in kraft pulp manufacture depend to a great extent on how efficiently the pulp cooking liquors are recovered and reprocessed. High chemical losses are serious because of the necessity for large amounts of makeup chemicals. Decreasing these losses, however, requires that accurate analytical results be available in time to take effective action.

## Former Method

The kraft pulp mill at the Kalamazoo Vegetable Parchment Co. Ltd., Espanola, Ontario had used the zinc uranyl acetate method to determine sodium mill sewer losses and sodium retention in the pulp. It took 11 man-hours per day to complete 14 sodium analyses; and the results of sewage effluent analyses were not available until 30 hours after the last sample had been taken. Calcium was determined in identical samples by either the oxalate titration or gravimetric methods. Because these results took so long to obtain, they were virtually worthless as a means of controlling and decreasing losses.

## Faster Method Found

To find another method of analysis that was faster and less costly, the mill tried the Beckman Model DU Spectrophotometer with Flame Attachment. Through its use, 43 analyses can now be completed in an hour and a half by operators who need not have extensive technical knowledge.

The steps required to prepare the instrument for a set of analyses require less than five minutes. After this, unknown samples can be handled at the rate of two a minute or faster. Sodium is determined at a wavelength of 589 millimicrons, and calcium at 554 millimicrons. For accurate interpretation of results, concentration vs. net luminosity curves must be plotted from a series of standard solutions.

Two different sets of analyses are performed daily. They consist of three shift composites from six sewage effluent stations, and three shift composites of pulp from each of two lines of brownstockwashers.

## Sewage Analysis

In the sewage analysis (U-drain test), a 10-ml. sample of effluent is diluted to 250 ml., and a few drops of concentrated hydrochloric acid added to insure solubility of calcium compounds if the solution is turbid. (If visible suspended matter is still present, the solution is filtered.) Only 5 ml. of filtrate are required for both sodium and calcium flame determinations.

## Brownstock Analysis

Sodium analysis of the pulp from the brownstock washers requires that each composite shift sample be diluted in a 4-liter pyrex beaker to approximately 1 per cent consistency. The slurry is agitated for a few minutes by stirring, and then approximately 150 ml. are removed and filtered with suction on a fritted glass 150-ml. pyrex filter into a 2-liter Pyrex flask. The pulp cake is washed with 500 ml. of boiling distilled water and the filtrate made up to 1 liter with distilled water in a volumetric flask. The pulp cake is removed from the filter and dried to constant weight. It was found that after such dilution and washing, only the equivalent of 1.2 pounds of saltcake per air-dry ton of pulp remain within the residue. This constant amount of sodium in the form of saltcake is later incorporated in the results.

The calcium content of the pulp from the brownstock washers is determined in a similar manner on a daily composite basis by taking aliquots of the three diluted shift pulp samples and proceeding as for sodium with the following modification: After the pad has been washed with hot distilled water, this filtrate is kept separate, and then the pad is washed with 100 ml. of hot 1:4 hydrochloric acid. The pad is next washed with 200 ml. of distilled water, finally making each filtrate up to 1 liter.

The second step is necessary for calcium in pulp from the washers because the filtrate from the acid wash must be kept separate from the original filtrate to prevent colloidal precipitation of lignin, which is undesireable in the final analysis. The total calcium content is derived by adding the calcium content of both filtrates.

Prior to the routine use of the Beckman spectrophotometer for the analyses

[1]This case history was supplied by Beckman Instruments, Inc.

*Exclusive* **Nose Baffle**
**Keeps B&W Recovery Units**

# ON THE LINE LONGER

Forced outages and down time are expensive in terms of both lost production and costs involved in getting recovery units back on the line. Keeping those costly, non-productive periods few and far between,—to clean and remove smelt deposits—is the job of the NOSE BAFFLE found *exclusively* in B&W Recovery Units.

**PROBLEM**—How to shield the ash deposits on the superheater from the radiant heat of the furnace, and direct the flow of high-temperature gas from the furnace so that all of the gas is cooled to the same degree before entering the superheater. The function of the Nose Baffle is to solve this problem.

**RESULT**—Through the use of the B&W Nose Baffle, ash deposits in zone where superheater tubes are closely spaced are soft, powdery and easily removed. The B&W Nose Baffle cuts frequent, difficult cleaning to the minimum and completely eliminates cleaning outages. Lower operating cost may be realized from lower temperatures, improved cleaning and continuous operation. The B&W Unit stays on the line longer.

And high availability is one of the many benefits of a B&W Recovery Unit. For nearly 20 years B&W Recovery Units have demonstrated economical operation and high availability in leading pulp and paper mills. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

P-786

**BABCOCK & WILCOX**

BOILER DIVISION

of sodium and calcium, the results of the small number of U-drain tests being made were not available until 30 hours had elapsed from the time of the last sampling. For this reason, the value of loss figures was mainly historical. Due to the work involved and the limited man-hours available, only daily washer losses were determined for each line of washers. Thus, some shifts with periods of high losses were not detected because the samples were composited to cover the whole day's operation.

### Savings Accomplished

Results now are available in less than four hours after the last samplings. Shift washers losses are determined for each line of washers, and the number of U-drain tests has been greatly increased. The loss results, expressed as pounds of saltcake per ton of pulp produced, are posted daily in each department concerned. Notes are made in red to attract the operator's attention to his specifice shift efficiency. Foremen discuss the losses with the operators before the figures become history. This results in quick action to eliminate costly losses of chemicals to the sewer. The washer operators now can compare their shift losses with the other shifts, and learn what operating conditions result in high saltcake loss. The superintendent also has a better picture of the efficiency of the washer operation and losses throughout the mill.

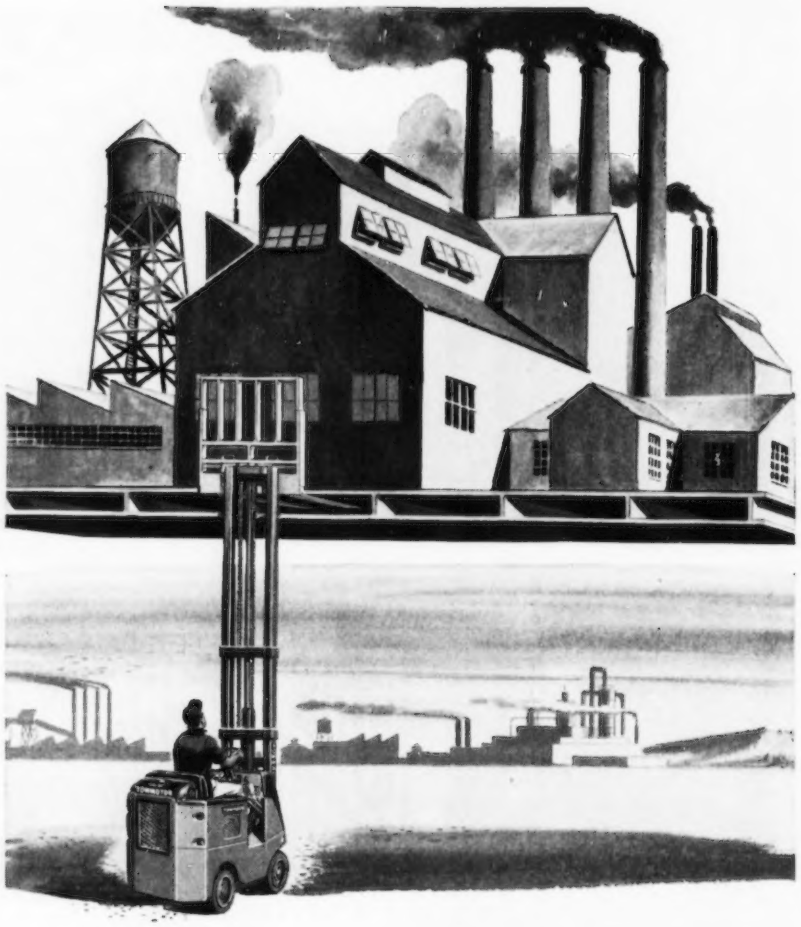
## New Synthetic Resin

### A Manufacturer's Report

A new synthetic resin, Chem Resin G, patent pending of Chemical Products Corp., Box 61, Little Falls, N. J., is offered for protective coating of paper. The water-white concentrate resin solution, ph 5, is stable and compatible in acid, neutral, and alkaline medium. It is dilutable and soluble in water and most organic solvents containing oxygen. The dried film is clear, firm, flexible, colorless, odorless, lustrous, non-tacky, and is resistant to nearly all hydrocarbon solvents, greases, and oils, it is said.

Its other properties for paper and board processing as a coating or saturant are said to be adaptablity over a wide range, non-curing, and heat sealing properties.

According to report, its aqueous solutions are adaptable for clay coatings and paper sizing, and its compatibility with resins, waxes and fillers adapt it for anti-blocking. Paper saturated with aqueous or solvent solution of the resin possesses improved abrasive resistance, tensile strength, tear strength, stiffness, and flexibility.

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PP54-4

# Constant Feeding of Fuel Bark by the Hofft-Weverk Bin Unloader

**Around-the-clock base feeding of a bark boiler at Chesapeake Corp. was made possible by the installation of an outside bark storage bin with automatic unloading screw.**

As told at the Mill to the Editors of Paper Trade JOURNAL

A pioneer in efficient steam generation by high-turbulance suspension-burning of bark (1), the Chesapeake Corp. at West Point, Va. has extended its achievement a step further. Chesapeake's original boiler is now capable of 24-hour steam generation on base-loaded bark fuel from a woodyard that operates only 16 hours a day. The key to this accomplishment was the establishment of a constant and automatic fuel feed from a specially constructed bark storage bin equipped with a Hofft-Weverk Bulk Storage Unloader. The equipment was designed and built by Miller Hofft, Inc., of Richmond, Va.

(1) R. Ellwanger, "Suspension Burning of Bark Refuse", *Tappi*, Vol. 35, No. 3, (March 1952).

## Former Operation

Before the present system was installed, the furnace could be fueled with bark, only during the two eight-hour shifts of woodyard operation. The hogged bark was conveyed directly to the boiler house where a live bottom surge bin fed it into the furnace. In order to consume the large quantities of bark produced during peak operation of the woodyard, the boiler often would have to operate at a rate of 160,000 pounds of steam per hour for more than three hours running. Although the boiler proved quite equal to such extremes, it had been designed for a maximum continuous rating of only 90,000 pounds per hour, with additional fan capacity to develop 150,000 pounds per hour if necessary.

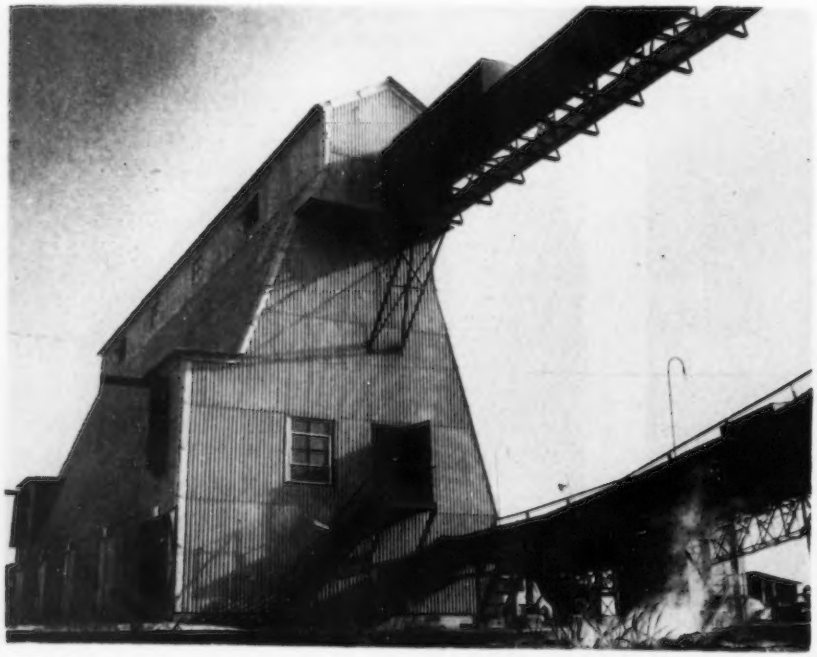


**FIGURE 1** — Floor of bark bin is on the level of the open door facing front. Ground floor is available for miscellaneous storage.

Under the old system, periods of peak operation were naturally followed by four-hour periods of slack operation, during which steam generation on bark would drop as low as 10,000 pounds per hour. Typical of the operating extremes during this period is the flow record shown in the left-hand chart of *Figure 2*. To remedy the obvious disadvantages of such fluctuations, company engineers worked with Miller Hofft to develop the continuous base-feeding system described below.

## Present Layout

To provide enough bulk storage of bark to insure a constant source and allow for retention space during temporary interruptions of the conveyor or woodyard, a storage bin was erected outside the boiler house.

It has a capacity of 17,000 cubic feet, and during normal operation it is about half full. Bark from the hogs is brought to the storage shed on a covered belt conveyor that enters the top of the shed and travels the length of the open-topped bin. A standard belt tripper unloads the bark evenly throughout the steel bin.

More than 18 inches of space have been left open between the bottom periphery of the steel-sided bin and the steel bin floor. This space provides running clearance for the unloading screw that traverses the length of the bin and feeds the bark at a given rate onto the boiler fuel conveyor belt. The belt carries the bark to the boiler house where it is discharged into the existing surge bin along side the bark boiler.

The system is set to feed just enough bark into the surge bin to permit positive base-loading of the fuel at the rate required for efficient plant load conditions. The rotating speed of the unloading screw, the rate of traverse of the unit, and the operation of both conveyor lines are controlled by instruments located beside the combustion control

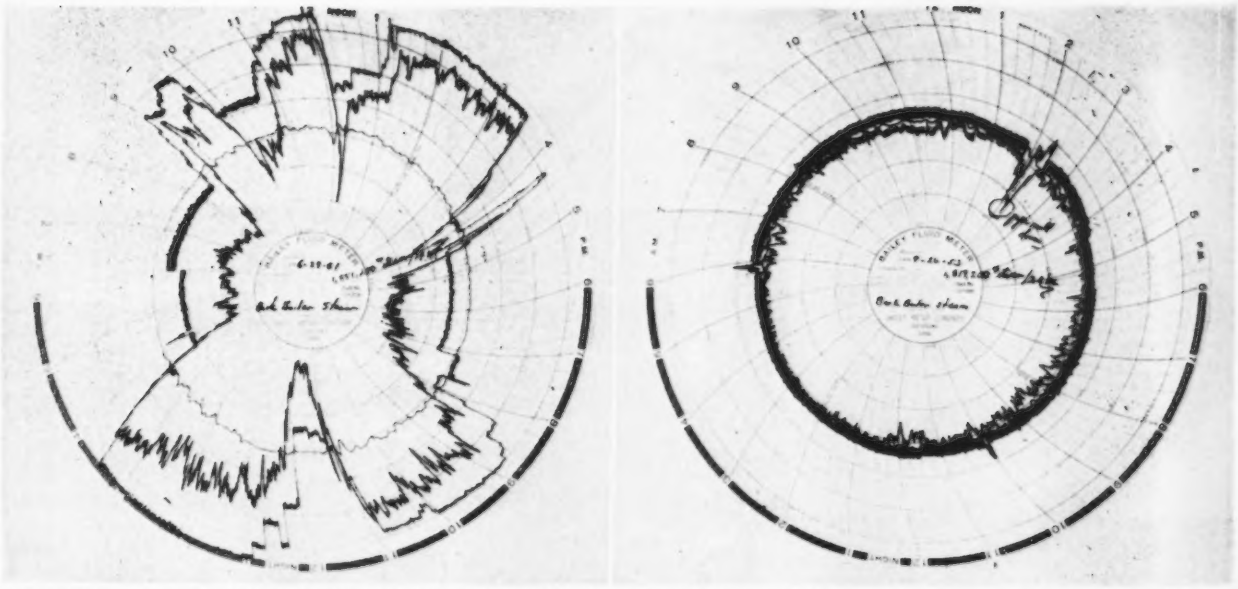


**FIGURE 2—THESE TWO 24-HOUR CHART RECORDINGS** of bark boiler steam generation present a before-and-after picture of the efficiency increase resulting from constant base feeding of the bark fuel. Total steam production on the two days is approximately the same, but inefficient fluctuations (left) have been eliminated (right).

panel on the main operating floor of the boiler house. No operator is required in the storage shed.

## Results Obtained

1. The power plant at Chesapeake Corporation is equipped with two 110,000-lb./hr. black liquor recovery boilers and a 200,000 to 250,000-lb./hr. pulverized coal and oil fired boiler in addition to the bark boiler. Before the present bark handling facility was installed, the fluctuating steam production of the bark boiler disturbed the thermal efficiency of the power plant and prevented optimum bark boiler operation. Now that the bark boiler operates continually at a constant rate (See righthand chart of *Figure 2*), the boiler's thermal efficiency has risen approx. 4 percent, resulting in an additional estimated annual saving of about $25,000.

It should also be noted that previously the bark boiler was supplementarily fired by oil to maintain approximately 50,000 lb./hr. steam flow when the woodyard was down. The present system has eliminated the need for any consumption of oil fuel in the bark boiler.

2. Uniform base-loading of the bark boiler has reduced other boiler maintenance. The former combustion extremes of the bark boiler caused excessive maintenance on the other three steam producing units. Now, steam production is held between 75,000 and 90,000 pounds per hour, the optimum range for which the boiler was originally designed.

3. Efficient storage of woodyard waste is another advantage of the installation. During scheduled shut-downs of the boiler when the woodyard was operating, bark waste had to be trucked away or piled up in the yard, necessitating extra handling to dispose of it eventually. Today, the capacity of the new bin will accommodate 16 to 18 hours of bark refuse at high production.

## The Bin

The Hofft bin is housed in a Transite-siding structure with a penthouse on top that encloses the incoming bark conveyor (*Figure 1*). The ground floor, under the base of the bin, offers space for truck garages and miscellaneous storage.

The bin itself measures approximately 70 feet x 12 feet at the bottom, and its sides taper upward to a height of 25

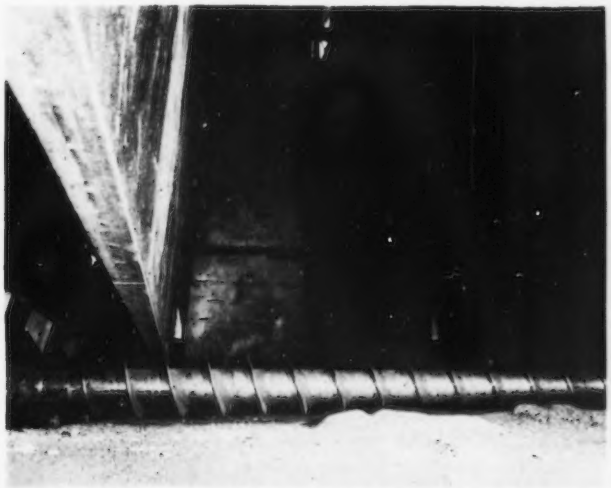


**FIGURE 3—INCREASING TAPER OF SCREW FLIGHTS** can be seen in this view of the far end of the unloading screw where bark is fed onto boiler fuel conveyor belt.

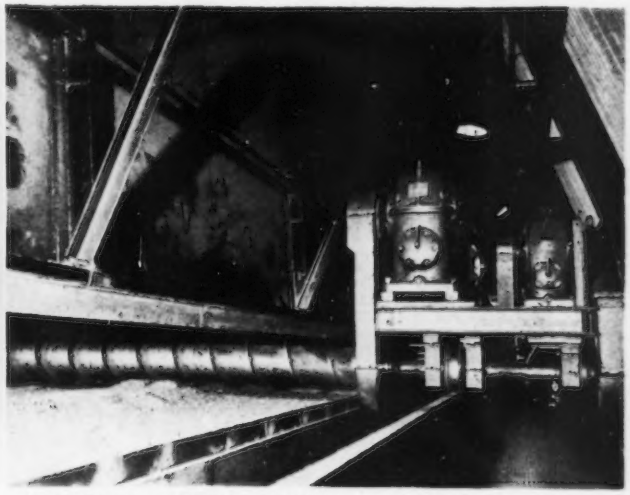
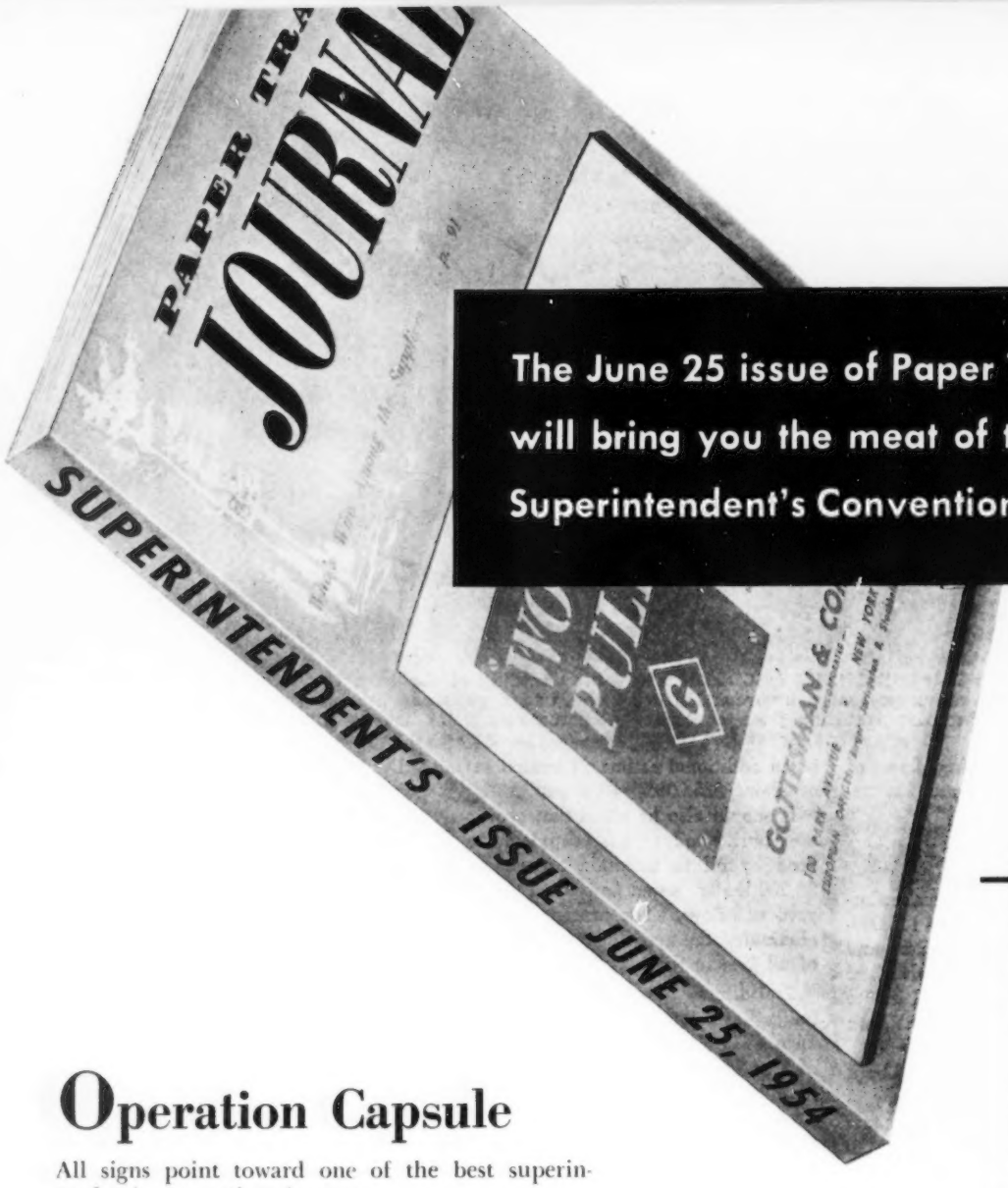


**FIGURE 4—SCREW DRIVE AND TRAVERSING DRIVE** are mounted on this traveling carriage. An 18-inch clearance between side and floor extends all around the bin.




**The June 25 issue of Paper Trade Journal will bring you the meat of the Superintendent's Convention in Montreal.**

*Donald R. Dick*

# Operation Capsule

All signs point toward one of the best superintendent's conventions in years.

Whether you are able to be in Montreal in June or not, the PAPER TRADE JOURNAL plans to bring you a summary of the most important points in such fashion as to constitute a realistic counterpart of having attended.

Our editors will listen to every paper in order to extract for you its most salient points, and to assure you of "covering" all significant points, in person or otherwise.

They will be your eyes as well as your ears, and through candid camera shots will show you old friends as they gather in informal groups and more formally in session and at special dinners.

In its OPERATION CAPSULE the PAPER TRADE JOURNAL will help those of you who attend the convention recall the important points that are made, and remember the lighter occasions. And the same OPERATION CAPSULE will bring to those unable to attend a condensed description of useable ideas, practical suggestions and discussions of methods and equipment.

## Review of Highlights

Here, for example, are some of the men whose papers you will find in capsule form (but in as much detail as may be required) in the June 25 Superintendents Issue:

OPERATION MANAGEMENT starts the convention Monday afternoon, June 21. Speakers include A. E.

ABP ABC

*A. E. H. Fair*

*Dr. W. Howard Rapson*

*W. K. Metcalfe*

*W. P. Nesbitt*

*G. H. Tomlinson*

*J. H. Martindale*

*Scheduled to Speak at the Superintendents' Convention*

Harold Fair, Alliance Paper Mills, Ltd.; John P. Burke, International Brotherhood, Pulp, Sulphite and Paper Mill Workers; James C. Cameron, Queens University.

Others to be heard over the next two days include—Willy H. Race, Hygrotester, Inc.; Kenneth Hay, Asten-Hill Manufacturing Co.; W. K. Metcalfe, J. O. Ross Engineering Corp.; James H. Martindale, Shartle Bros. Machine Co.; Al Beecroft, Rolph Clark Stone Ltd.; Robert S. Young, Hammermill Paper Co.; W. P. Nesbitt, Howard Smith Paper Mills, Ltd.; G. M. Dick, Canadian-Ingersoll Rand Co., Ltd.; Inglis W. Edwards, Dominion Engineering; G. H. Tomlinson II, Howard Smith Paper Mills Ltd.; N. G. M. Tuck, Howard Smith Paper Mills, Ltd.; John M. von Bergen, Airkem, Inc.; Dr. W. Howard Rapson, Prof. Chemical Engineering—University of Toronto; Dr. W. J. Nolan, Prof. Chemical Engineering Research—University of Florida; Gerald Alcorn, Weyerhaeuser Timber Co.

The papers and panel discussions by these and other authorities will be available to you in the June 25th Superintendent's issue of the PAPER TRADE JOURNAL . . . an issue you will want to keep handy and refer to again and again.

## Note to Advertisers

The June 25 issue of PAPER TRADE JOURNAL is one that superintendents will read, use, study and keep, for it reports *their* convention and reports it in a way that will be easy to read, quick to refer to and mighty valuable to have around.

It is suggested, therefore, that advertisers who take advantage of this particular issue may want to plant their messages so that they have a maximum value over a long period of time. If you have a choice between concentrating on one feature of your product or listing all of its features, it is suggested that for this particular ad you report in comprehensive manner *all* of the advantages of your product.

If you have a range of products or a range of size and models, it is suggested that you cover the complete range so that the superintendents who refer to this issue again and again over the months will be reminded frequently of your entire line.

If you are a regular advertiser in PAPER TRADE JOURNAL you will need no argument here as to the value of this special issue. On the other hand, if you are not currently advertising in the PAPER TRADE JOURNAL, this would make an excellent issue in which to start, for it gives you the timeliness of a weekly publication combined with the permanence of a convention issue which is brought out but once a year.

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feet. The steel bin floor, unattached to the sides, extends about two feet beyond the sides all around *(Figure 3)*. The level of bark refuse contained in the bin is automatically indicated on the boiler house control panel by electric eye scanners placed at various levels up the sides of the bin.

### The Unloader

The heart of the system is the bin unloader, which is a single feed screw mounted on a hollow shaft that spans the width of bin floor and traverses the length of the bin. A second shaft passes through the hollow shaft and is driven at each end by pinions that engage racks running the length of the bin. Roller bearings are provided between the center shaft and the hollow tube.

### The Drive

The tube, carrying the screw, is rotated by a 25 hp. D.C. drive motor and reducer through a chain and sprocket reduction. The speed of rotation is controlled (from the boiler house) to establish the desired rate of feeding.

The center shaft is rotated at a slower speed by a separate reducer type variable speed transmission. The rotation of this shaft causes a horizontal translation of the screw. The two motors, reducers, and bearings are mounted on a carriage which travels on a rail *(Figure 4)*. The far end of the screw is also supported by and travels on a rail *(Figure 3)*. Power to the motors is supplied through cable reels. As the cables unwind, the reels build up spring tension which is released to wind up the cables on the return traverse of the carriage.

The screw flights are constructed of nickel chrome cast iron to resist abrasion. The screw flight tapers to a maximum diameter of 18 inches at the discharge end, farthest from the motor. The taper allows the screw to carry along an increasing volume of bark across the width of the bin. Each flight is split along the screw centerline to facilitate removal as required.

### Traverse Reversal

The screw always rotates in one direction. The rotation of the center shaft, however, must be reversed at each end of the bin, and this is accomplished by the automatic reversing of the traverse motor as the moving carriage trips a limit switch at each end of the rail. As a measure of safety, a second limit switch is installed a short way beyond the first at each end. Run-out bays have been provided at each end of the bin so that the entire unit can be run clear of the bin for inspection or maintenance.

### Non-Arching

The screw, as it travels the length of the bin, is continually undercutting the arches that would tend to form over non-traversing screws. Although the rate of traverse can be varied, it is seldom necessary. Varying the speed of screw rotation will generally accomplish any desired changes in the rate of feed. Under normal operation, the unloader makes a round trip about once every eight hours.


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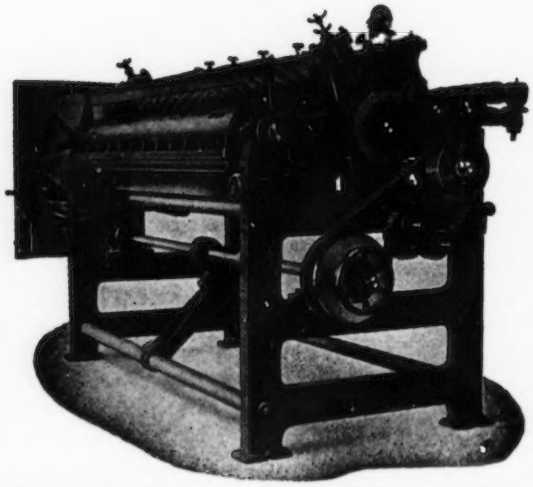

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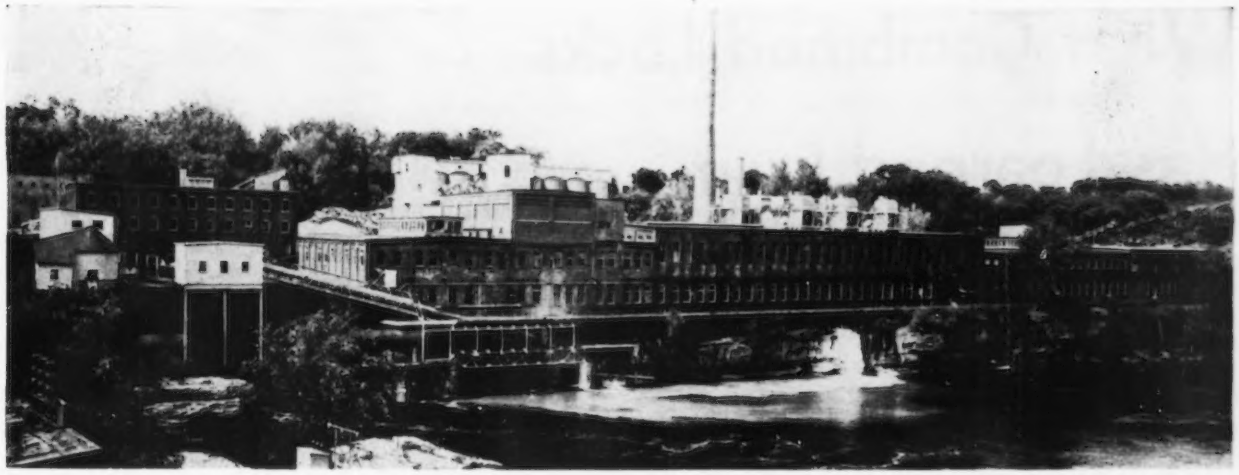

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# What Combined Locks Has Learned From Fifteen Years Of Metallizing

**Edward Lindberg**

Master Mechanic, Combined Locks Paper Co., Combined Locks, Wis.

Possibly there are other paper mills that have been metallizing longer than we at Combined Locks, but it is doubtful if there are any who have used the process as extensively. We like to consider ourselves oldtimers in the use of this versatile "putting-on" tool, and how we got along without it years ago is difficult to imagine. It is certain that, if not replaceable, many thousands of dollars could not buy our present equipment from us. Actually we should speak in the plural and not singular as there are at present 6 complete units in our shop. We have 3 standard all-purpose guns and 3 heavy duty metallizing machines. The latter are used primarily on such work as large rolls, and it is not uncommon to hook up 2 or even all 3 of them at once.

## Early Equipment

When we first considered metallizing many years ago we were a little dubious as to its suitability for our rather rugged maintenance problems. The best equipment of that day could spray only 3 or 4 pounds of steel per hour and was tricky to operate. Surface preparation which, by the way, is the main "secret" of metallizing, consisted only of cutting a rough thread. This was very difficult on some metals such as stainless steel or bronze, and the human element also was important. Tell a really good machinist to cut a rough, tearing thread and likely as not he couldn't or wouldn't do it. There also was the possibility of setting up a sharp fracture point subsequently to be concealed under the coating. We were further handicapped by a limited selection of spray metals, little original instruction, inadequate manuals and no general handbook of any kind. Even in the face of this we went ahead with our first installation and have never had cause to regret doing so. Anyone contemplating going into metallizing today is not faced with those problems. Here is what they will find.

**FIGURE 1 — PATCHING** one of six areas on a dryer roll that has been damaged by a doctor blade. Hard stainless steel is being applied.

## Modern Improvements

The modern metallizing gun is in effect a self contained machine. Possible speed fluctuations are controlled by an automatic governor. A syphon principle equalizes the flow of oxygen and acetylene, and a built-in oil pump takes care of the lubrication. The curved blade air turbine, which can turn up 30,000 r.p.m., is so powerful that it will pick up a dead weight of 75 pounds or even straighten out heavy steel wire. It uses 3/16 inch wire and easily sprays 20 pounds of stainless or 35 pounds of bronze in an hour. We used to hang over the old guns waiting for something to happen, and quite often, quick adjustments were necessary. The present day operator makes his initial settings, sits down, and has little to do except watch his metal and gas supply. Accessories have been improved accordingly.

Metalizing Engineering Co. Inc., from whom we now obtain our equipment, provides good, detailed instruction manuals for our use in the operation, care, and cleaning of our guns. Also available is a handbook running to nearly 300 pages which covers the process in general and answers most of the questions that come up. There are nearly 30 different stocked metals from which we can choose. These include babbitt, hard and soft steels, and stainless steels, as well as zinc, aluminum, and the various copper alloys. In fact any metal obtainable in wire form can be sprayed. One of the newest and most interesting of these metals is an alloy of a high molybdenum content. This material has the unique property of bonding directly to smooth or even polished steel. It is generally used as a means of surface preparation thus eliminating mechanical roughening by threading or grooving. We also get a lot of help from our supplier's field men who keep us abreast of the latest developments. They will also come in at our request if we need technical advice on new or unusual jobs.

### Cheaper and Better

We are sometimes asked just why we have gone in for metallizing in such a big way. We have two primary interests in equipment of this general type. First we want to have money by handling our maintenance work in the least expensive way. Generally speaking, it costs us from 10 to 20 percent of replacing a part to do a metal spray job on it. There is also what might be called an interesting by-product here. Any metal can be applied to any metal, so we use a great deal of bronze and stainless steel. On mild steel or cast iron this gives us a salvaged part that is better than new. Incidentally, sprayed metal, because of its oil absorption qualities, is a very superior bearing surface.

### Faster Maintenance

Second, and often of even greater importance, is the time element. The metallizing and welding facilities in our shop make it possible for us to repair a worn or broken equipment component in little more time, in most cases, than it would take to remove the part and install a new one. This procedure also makes a minimum spare parts stock both possible and economical. It reduces down-time, eliminates much parts reordering which can take months, and keeps equipment in first class operating condition since costly parts can be kept in service instead of discarding them and ordering new ones.

### Actual Applications

The actual parts that we build up, to name only a few, and pump shafts, packing glands, pump seal rings, cylinder sleeves, dryer rolls, press rolls, applicator rolls, pistons, rams and pump impeller rings. One of our most spectacular and yet common jobs is shown in *Figure 1*. The operator is patching one of 6 areas on this 48-inch x 102-inch dryer roll that was damaged by doctor blades. The roll was sprayed with a hard stainless steel some time ago and most of the surface is still in excellent condition. When ground smooth it will be difficult to tell where the patching took place.

**"Generally speaking it costs us from 10 to 20 per cent of replacing a part to do a metal spray job on it." . . .**

Procedure on this job was to undercut 1/16-inch, apply about .003 inches of molybdenum alloy as a bonding coat, and then complete the buildup to 1/32-inches oversize with hard stainless. We generally finish by grinding although many of the metals are machineable.

The surface preparation, metallizing and finishing described, is now pretty well standardized. When the entire surface of this roll was first sprayed the above procedure was followed closely. We used 2 guns simultaneously and applied 365 pounds of metal. When grinding is completed these rolls are mirror smooth. Sometimes they wear slightly out of round. Undercutting and spraying corrects this condition. Still another reason for using the stainless is its non-corrosive quality and the fact that paper tends to stick to it less than to other metals which might be applied. One of our machines has even larger rolls and when these are re-surfaced we use 3 guns together.

*Figure 2.* illustrates an impressive testimony as to the real value of metallizing. Contained here are almost certainly more metal sprayed areas than on any other single piece of machinery in the world. Every journal on both ends of the 38 dryer section rolls has been sprayed. Many of the rolls themselves are now stainless clad so we have nearly 100 examples of sprayed metal on this one machine—and the parts saved are better than new. Our only alternative on the journals would have been to cut them down, fit a smaller bearing and replace the gear. Any reader who has faced this problem will realize the amount of time and money that we saved. One hundred more reasons why we look upon our metallizing guns as our best friends in time of trouble.

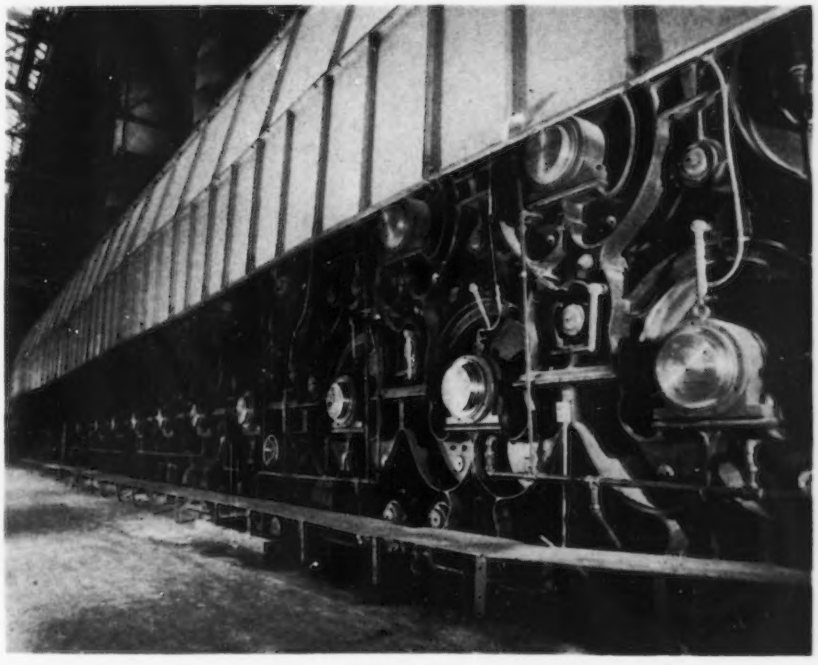

**FIGURE 2— EVERY JOURNAL** in this 38 roll dryer section at Combined Locks has been metalized at one time or another, as well as many of the rolls themselves.

# What Bauer Cleaners Are Doing At Flambeau

**L. M. Gibson**

Sulphite Superintendent, Flambeau Paper Div., Kansas City Star Co.

The fine paper industry is always looking for methods to improve paper quality. The first quality of a sheet of paper is eye appeal. The paper may have all the other necessary qualities, but if it does not pass the test of appearance to the eye it cannot meet the competition. When the customer looks at an 8½" x 11" sheet of paper, the first quality that meets his eye is cleanliness. When the customer sees, in one sheet of paper, two to twenty black and brown dirt specks from a pin point to a pencil point in size, the mill and the salesman have two strikes against them immediately, and they just came up to bat.

The change from a sellers' to a buyers' market in 1951 really put competition in paper quality back into the paper business. At the Flambeau Paper Division, Kansas City Star Co., we needed to improve the quality of our paper in dirt speck count as characterized mainly by bark specks and other foreign particles of like size. These particles were of that size classification that would pass through an .008 cut flat screen plate. They appeared in large numbers all down the line in all screens. Our first step to correct this was further wood cleaning.

## Wood Supply

This mill operates with hemlock, balsam, both local, and some Canadian spruce, poplar and white birch. The biggest percentage of this wood comes to this mill within the range of truck hauling. The quality of timber has decreased over the years. This is especially true of the hemlock, poplar and white birch. They all have considerable ingrown knots, catfaces, forks and other deformities with ingrown bark. The mill normally spent little labor on hand-cleaning of wood. We now increased the man hours for cleaning and sorting. The end result on the paper machines showed little or no results for the better. The reason for this was that there was more unseen bark in the log than showed on the outside. Thus, costs were up without much gain in quality.

At a TAPPI meeting in November, 1951, at Wisconsin Rapids, Wisconsin, C. K. Textor of Bauer Brothers Co. gave a talk in which he mentioned a new kind of pulp cleaner that would soon be on the market. This cleaner was supposed to remove just the type of dirt that was our problem. I spoke to Mr. Textor after the meeting, and he informed me that they would be more than glad to make a test run on our stock.

## Explores the Field

In December, 1951, I sent him a sample of our bleached sulphite. While we were awaiting the results, we were dealing with several other companies for equipment for the same purpose. However, none of them could prove to us that the equipment would do the job. We wanted concrete evidence that the cleaned stock would look better than the uncleaned. It is one thing to see dirt in the rejects and another to see the results on the finished product. (See *Figure 2.)* The Bauer tests finally came back in March, 1952. They were the best we had seen, but were not conclusive on bleached stock.

On May 14, 1952, we received hand sheet samples of semi-chemical stock from Hammermill Paper Co., which did the original work on this type of cleaner. These samples looked very good but, of course, were not made of our type of stock.

We ordered one 3" x 3" Centri-Cleaner (now known as the Bauer Cleaner) to experiment with ourselves. Before we had time to use it we had sent 800 pounds of wet lap unbleached pulp to Howard-Smith Paper Co., at Cornwall, Ont., and received hand sheets. Also, we had received sheets from Gaspesia Sulphite Co., Ltd., at Chandler, Que.

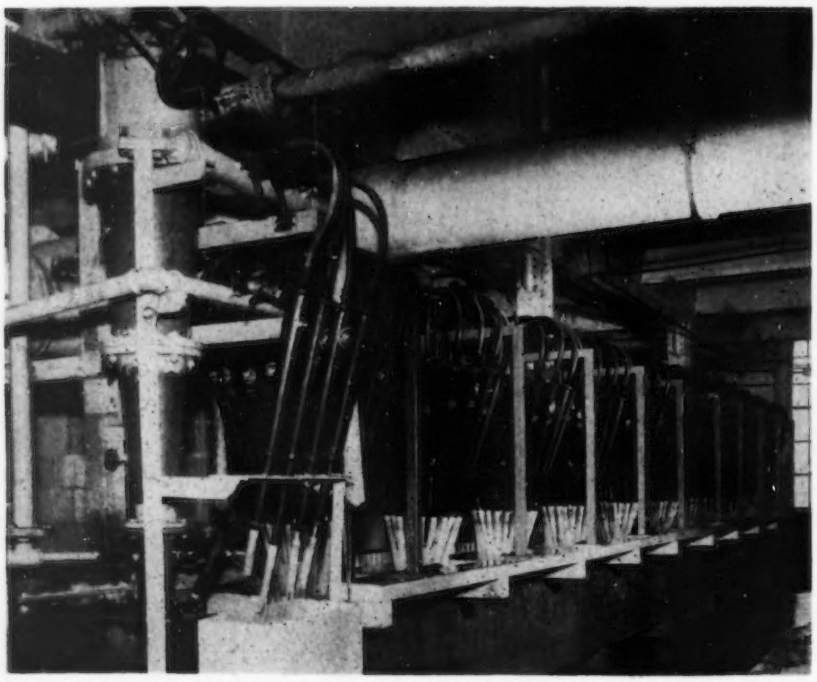

**FIGURE 1—TWO HUNDRED OF THE 3" x 3" CLEANERS** make up the primary stage of the Flambeau mill installation. These lead up to the 12" x 4" x 4" secondary cleaner (left foreground). Four 3" x 3" cleaners make up the tertiary stage (central foreground).

The next move was to order a cluster of twenty 3″ x 3″ of the original Hammermill-type Centri-Cleaner units to run a mill test in comparison to other types of cleaners. Before this equipment could be shipped we had reached the conclusion, from studying the various samples, that the Bauer Centri-Cleaner would do the job. This is the only types that shows from a glance at the original stock compared to the cleaned stock, that the stock has been cleaned. All tests proved that an installation to handle our full production would reduce our speck count 80 to 90 percent in the finished paper. (See *Figure 2.)* Thus, such an order was placed for 60 day delivery. We realized that, along with Bauer Brothers Co., we were pioneering in a new field. The Bauer Cleaners were installed and operating by October 1, 1952.

## Flambeau's Installation

Bauer Brothers Co. recommended that for 100 tons unbleached sulphite per day we use two hundred 3″ x 3″ cleaners for the primary stage, one 12″ x 4″ x 4″ cleaner for the secondary stage and one to four 3″ x 3″ cleaners for the Tertiary stage *(Figure 1).*

### Primary Stage

The 3″ x 3″ cleaner handles 20 g.p.m. at 40 pounds pressure, has a ⅛″ reject nozzle, and operates on stock at 0.5 percent consistency. They accept 75 percent and reject 25 percent to the secondary. This worked excellently except the nozzles plugged very often. Most of this was due to material left in the lines and boxes during construction. However, we enlarged the reject nozzles to 5/32″ and this cleared most of the trouble. This increased the discharge to the secondary. However, we were feeding 0.6 percent consistency stock to the system instead of the intended 0.5 percent and operating at 45 to 50 p.s.i. instead of 40 p.s.i., thus we still had ample capacity. These changes did not affect the cleaning efficiency.

### Secondary and Tertiary

The secondary 12″ x 4″ x 4″ unit handles about 800 g.p.m. at 40 p.s.i. and has a 1¾″ reject discharge nozzle. Dillution water is added here to hold the consistency at 0.5 percent. The accepted stock is returned to the primary feed stock. Dillution is added to the secondary rejects to feed the tertiary units at 0.5 percent consistency. The tertiary rejects are wasted to the sewer recovery unit. Sewer losses run 400 to 800 pounds total solids per day, made up of 25 percent ash, 20 percent fiber and the rest round dirt. The 20 percent fiber is mainly short fiber, probably ray cells and of little value.

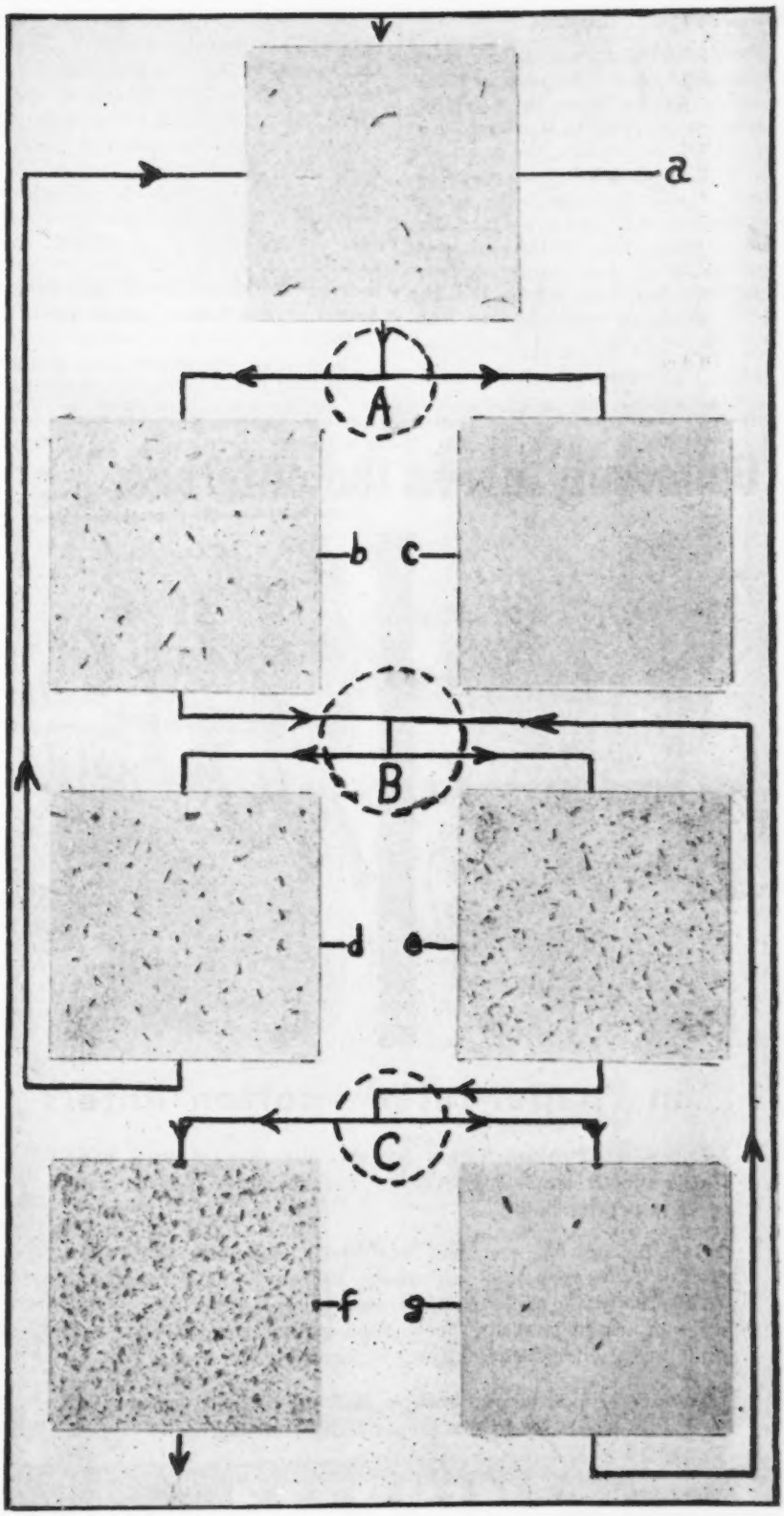


**FIGURE 2—HAND SAMPLES** show results obtained at Flambeau. Legend: (A) primary cleaners, (B) secondary cleaner, (C) tertiary cleaners; (a) flat screen stock, (b) rejects to secondary, (c) accepts to bleach plant, (d) accepted from the secondary, (e) rejects to tertiary, (f) rejects to sewer, (g) accepts to secondary.

## Maintenance Problems

The first difficulty was the aforementioned reject nozzle. We now use 9/64" opening. We find them big enough to keep down the number of plugged nozzles. Also, the smaller the nozzle to start with, the longer it will operate before it is worn too large. The second difficulty was wear and cost of replacement of worn parts. Nozzles and lower cones on the 3" x 3" primary cleaner units would last three months, then the rate of discharge would be too high. Those on the tertiary 3" x 3" wore out in 7 to 10 days.

The manufacturer then changed the design. The lower cone section was shortened and the underflow nozzle was lengthened. This underflow or reject discharge nozzle then covered the area of greatest wear and only one part had to be changed instead of two. These underflow nozzles, made of nylon, wear much longer than the hard rubber of the cone. This change doubled the life of the underflow nozzles, and the price was cut in half. The net result was some three-quarter reduction in cost on the primary units.

The tertiary units reject discharge nozzles made of nylon still only last 7 to 10 days. The material rejected here is 20 percent to 50 percent sand and lime from the cooking process which, at the high rate of spin in the cone, is very abrasive. We are now using tungsten carbide underflow nozzles and in six months they have not worn appreciably. They are very expensive, but will pay for themselves in this location over a three to six months period.

The secondary 12" x 4" x 4" unit has been used as an experimental unit by Bauer Brothers for plastic lining material. The lower cone and reject discharge nozzle on this unit last about three to four months. The reject discharge nozzle here is bronze. This should also be made of tungsten carbide in our operation to get maximum life. We have used several sizes of nozzles on this unit and now find that $1\frac{3}{8}$" is the most satisfactory.

Even wear in the lower cone section and nozzle of either cleaner does not materially reduce the efficiency of the unit, but does increase the rate of rejects. This cuts down the production capacity of cleaned stock and tends to overload the secondary and tertiary units.

The lower cone section of the 3" x 3" is made of hard rubber, and the reject discharge nozzles are made of nylon. Each has a different coefficient of wear. The hard rubber wears first and forms a ledge above the nylon and the efficiency drops. The same thing happens on the 12" x 4" x 4" where the lower cone section is lined with plastic and the nozzle is bronze. The drop is small percentage-wise, but serious if too many units are in this condition at one time. The replacement of reject discharge nozzles on our units is now staggered by clusters which helps to maintain an evenly clean stock. Nozzles are changed by measurement rather than by a check on the dirt count entirely.

Bauer Brothers are still experimenting with materials, attempting to find some that will better withstand the erosive conditions in the cleaner. We are cooperating in the experiments on a mill scale as much as possible. A great deal of progress has been made, and units offered today are much better than those we originally installed.

## Change In Secondary

We believe, and have proven to ourselves by tests, that the 12" x 4" x 4" cleaner should be removed from the system and the entire job done with the 3" x 3" cleaners. The large cleaner is not efficient on speck dirt, but is on some small slivers. If the rejects from this secondary unit were discharged to the sewer, the sliver rejects here would be important, but the loss would be too


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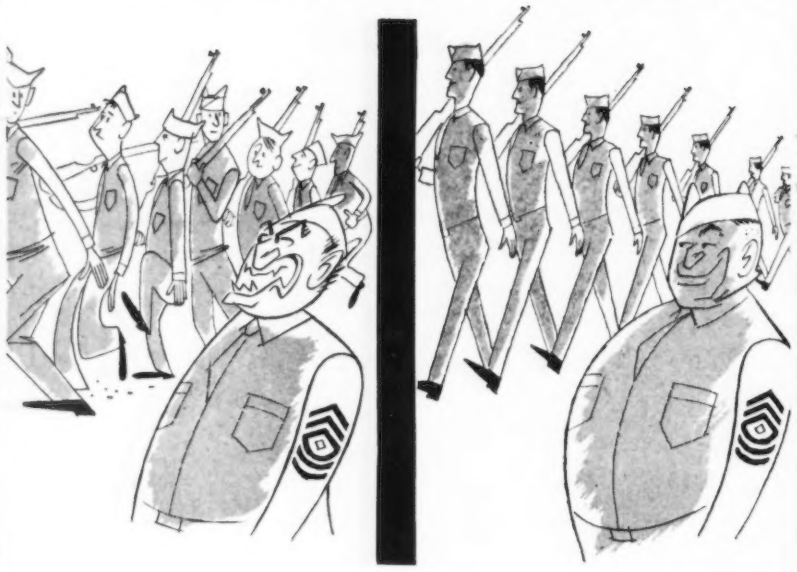

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great. The 3″ x 3″ units in the tertiary stage do not reject these small slivers, so nothing is gained by using the 12″ x 4″ x 4″ secondary to remove slivers when the 3″ x 3″ units in the following stage will not do the same. Also, more speck dirt travels round and round before being finally rejected from the system.

We also find that when 3″ x 3″ units are used as secondary units, the accepted stock is clean and may be added to the primary accepted stock. In the near future our system will be changed over to all 3″ x 3″ units.

### Conclusions

A mill scale trial was run on screened groundwood. The results were very good, and if it were necessary we would install Bauer Cleaners in our groundwood system.

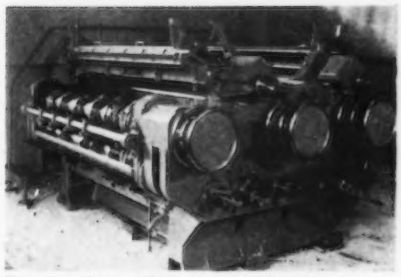
This mill's experience with Bauer Cleaners on the entire sulphite unbleached production has been excellent and the speck dirt count has been reduced by 85 percent to 90 percent in the finished paper. They have reduced our woodroom cleaning operation by four men per day, which alone would shortly pay for the installation. The paper is now even with and above our competitor in quality as characterized by bark speck and like dirt. We have the highest regards for the product and its manufacturer.

## Thin Wall Stainless Steel Tubing

### A Manufacturer's Report

A new high strength, thin wall stainless steel tubing has been developed by Flexonics Corp., 1315 S. Third Ave., Maywood, Ill., for industrial uses where corrosion resistance, light weight and special shapes or bends may be required. Also offered are special engineered applications of the tubing in combination with fittings and its own flexible tubing or expansion joints. The tubing is known as Flexon.

Flexon standard straight wall tube is available in fifteen outside diameters ranging from 1″ to 6″. The high strength comes in thirteen outside diameters, from 1.50″ to 6″. All but the smaller sizes are available in four wall thicknesses designed to withstand various pressures. The 1.50″ size in high strength, and the 1″ and 1.25″ sizes in the standard are made in three different wall thicknesses. On special order, the company will supply diameters, wall thicknesses and tolerances other than those shown in specifications. Ordinarily, tolerances are plus or minus .002″ or .003″.



## Redesign Printer-Slotter

### A Manufacturer's Report

Greater operating speed, more accurate printing, and simplified servicing and maintenance are said to have been built into a re-designed Langston 32 by 73 inch printer-slotter, made by the Samuel M. Langston Co., Camden, N. J. This machine is known as the Special VL series printer-slotter. It is a 15-ton unit that takes blanks of corrugated board up to 32 by 73 inches and prints, slots and scores them prior to final assembly into a finished corrugated container.

According to the manufacturer, this unit features more rugged construction, continuous running speeds of 300 blanks per minute, larger diameter slotting and scorer shafts, simplified controls to permit faster set-up and make-ready. It is also said that the print cylinders and front feed rolls can be changed in half the time required for previous model.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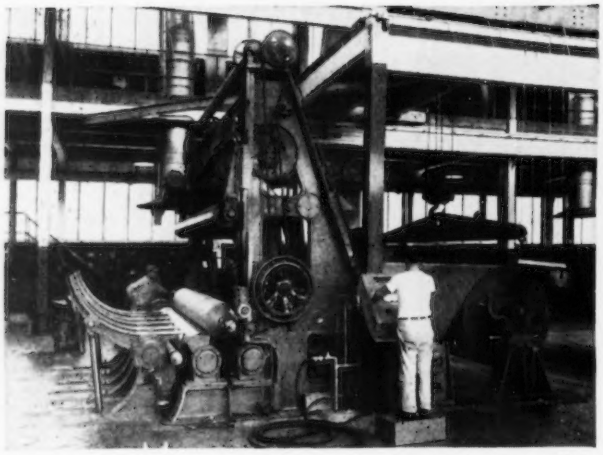

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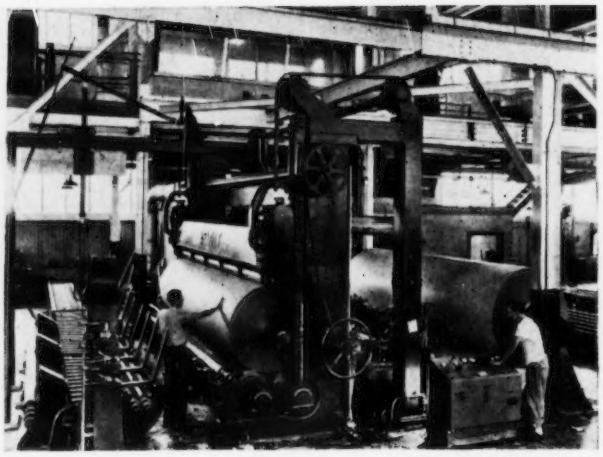

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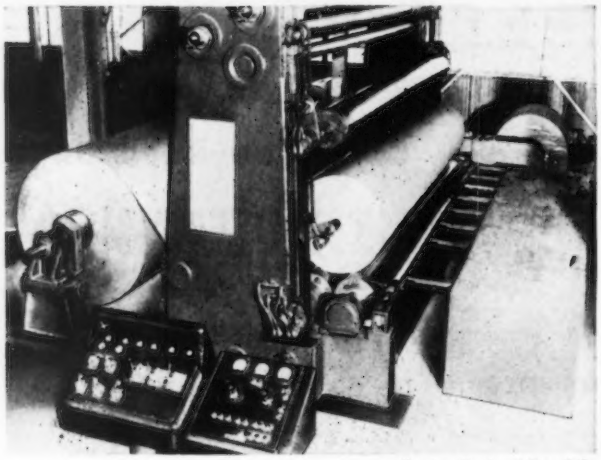

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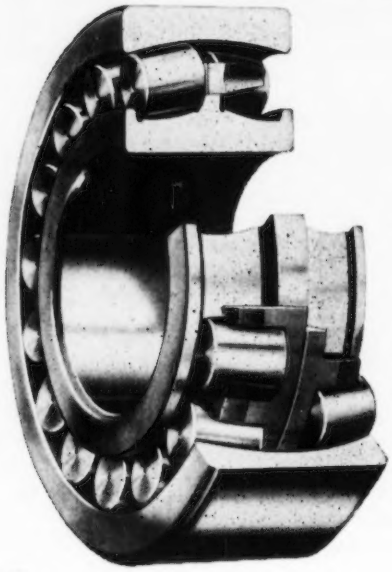

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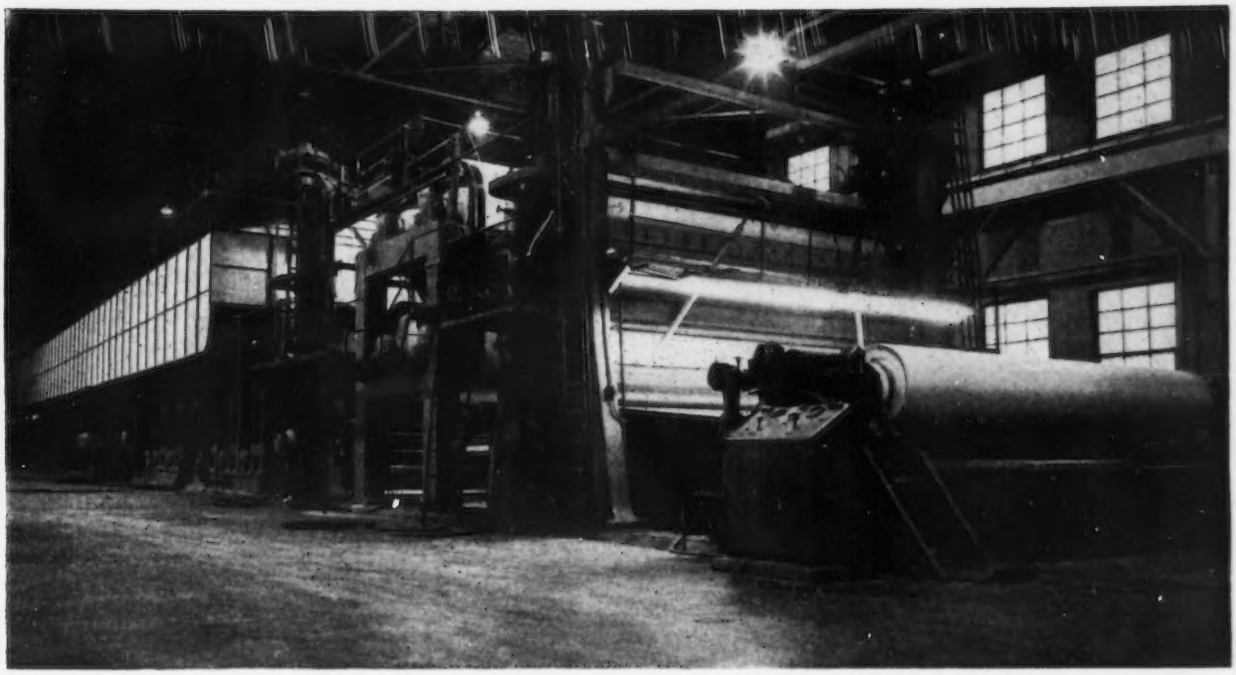
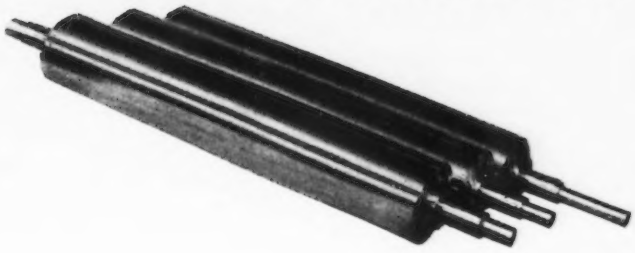


# In Potlatch Forests' New High-Speed Mill



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# What Bauer Cleaners Are Doing At Spaulding Pulp & Paper Co.

**H. R. Clodfelter**

Chief Chemist, Spaulding Pulp & Paper Co., Newberg, Ore.

During the past few years the increased demand for cleaner unbleached sulphite pulp has forced considerable attention to improving the methods of cleaning pulp to meet quality standards set up for the particular grade. Increased costs of wood and labor and a decreasing supply of good clean wood have contributed greatly toward the production of chips containing more undesirable wood components that carry on through the pulping and screening processes and into the finished product.

All this has occurred at Spaulding Pulp and Paper Co. in the production of unbleached sulphite pulp from western hemlock, spruce and white fir woods. Our new wood breakdown mill (a bandmill head-saw and chipping equipment to handle cants and whole logs to some 20 inches in diameter) has reduced to a minimum the opportunity for hand cleaning, resulting in an increase of wood dirt particles. Despite improvements in the methods of pulping the wood and screening the stock, we have received complaints from our customers regarding the dirt content of the pulp. It is possible that economic factors may have possibly influenced the complaint.

## All Types Tried

In an attempt to improve the quality of pulp with respect to the dirt content, a series of hydraulic centrifugal cleaners have been tried. The first installation occurred early in 1949. Each make of cleaner has removed some of the objectionable material from the screened pulp, though none have accomplished the degree of dirt removal desired. This degree could be assumed to be complete removal of all material not desired by the customer.

## Installation of Bauers

The last make of cleaner to be used on our unbleached sulphite which has been screened through flat screens is the No. 601 - 3 x ½ x ⅜ Bauer Centri-Cleaner (now known as the Bauer Cleaner). This installation to clean 120 air dry tons per day consists of 248 cleaners setup in a three stage system, comprising primary, secondary and tertiary passes. The primary pass consists of 200 cleaners arranged in ten clusters of 20 cleaners *(Figure 1)*. Rejects from the primaries are diluted with machine white water to make the feed for the secondary pass which contains 40 cleaners or two clusters of 20.

Accepts of both the primary and secondary stages are combined and go to the wet machine for final processing. The rejects from the secondaries are diluted with white water and pumped to 8 cleaners that make the final pass *(Figure 2)*. Accepts from the tertiary pass are mixed with the primary rejects and so are recycled through the secondary cleaners. Rejects from the tertiary pass are added to the knotter and flat screen rejects for disposal as screenings.

Floor space required for the cleaners, complete with flow boxes and pumps, is 20 by 30 feet with the accepts header approximately 10 feet from the floor. Diluting white water to both the primary and secondary reject flow boxes is float controlled to give a reasonable control of consistency and to maintain a liquid head

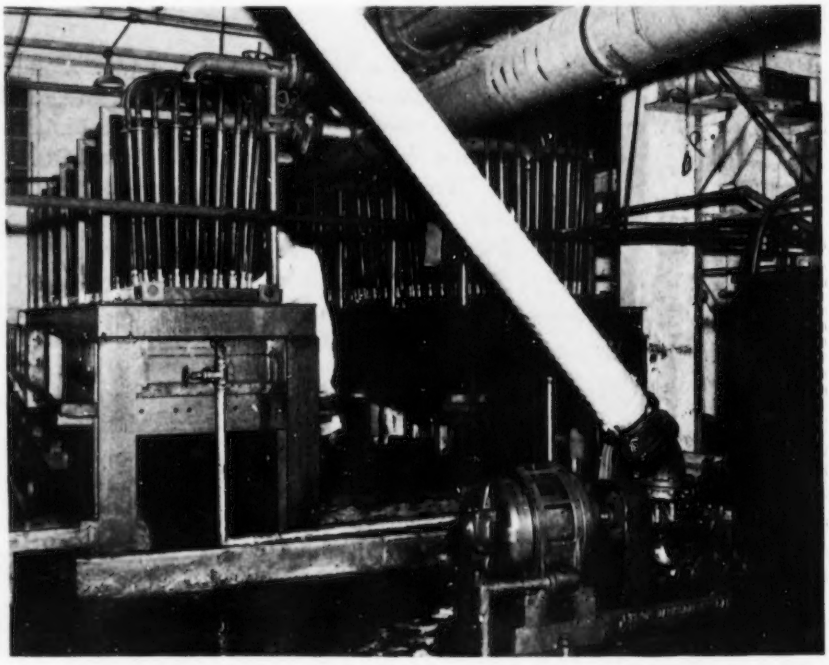

**FIGURE 1—PRIMARY PASS INSTALLATION** at Spaulding Pulp & Paper Co. consists of ten clusters of 20 No. 601 Bauer cleaners. Two large pipes are the accepts header (top) and the primary feed header (bottom).

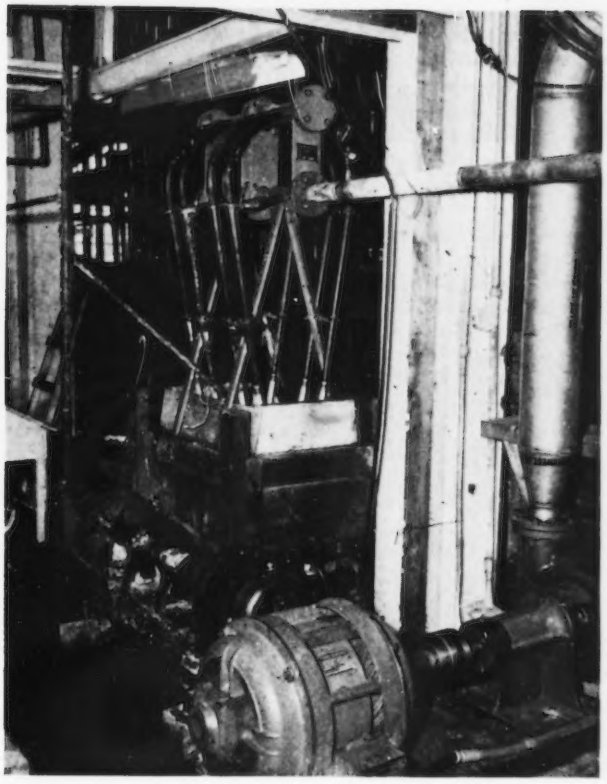

**FIGURE 2—TERTIARY PASS** utilizes eight cleaners. Pump for the secondary pass is in the right foreground. Tertiary reject pump is behind it (left)

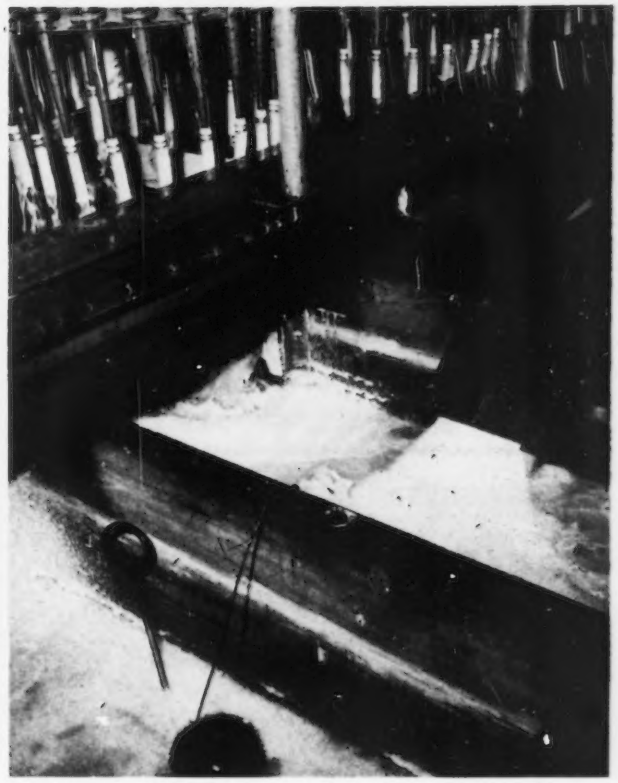

**FIGURE 3—DILUTING WHITE WATER FLOW** is controlled by float valves in the flow boxes of the Spaulding installation.

to the secondary and tertiary pumps. Installed horsepower is 167.5 divided as, primary 125, secondary 30, tertiary 7.5 and rejects 5. This is 1.4 horsepower per ton per day.

Regulated stock at 3 to 3.2 percent b.d. consistency enters the cleaning system through an enclosed control gate into the inlet of the primary pump. Machine white water and part of the primary and secondary accepts are added at the pump inlet to lower the consistency to 0.65 to 0.75 percent b.d. The bypass of accepts provides to some extent control of stock flow to the machine vat. This system operates quite satisfactorily without a separate fan pump.

## Maintenance Required

Isolation valves are installed on each cluster so one may be taken out of service without shutting down the machine. Normally, the cleaners operate with only routine attention by the machine tender. During an eight-hour shift, some 10 to 12 tips will require cleaning. Most of the material causing the stoppages has been extraneous to the stock through the long fibers and wood shives cause some pluggage in the primary pass. Other difficulties include bursting of inlet hose and hose coupling, pebbles or other hard objects wearing into the hard rubber of the lower cone section and the loosening of the plastic lining in the outlet biscuit and pipe.

The cleaners were supplied with nylon tips that have $\frac{1}{8}$-inch or 0.125-inch openings. Tip wear has been rather excessive, particularly in the secondary and tertiary passes. A noticeable increase in the percentage of rejects occurs as the opening enlarges. Wear is most probably the result of the abrasive action of grit-like particles, though it is possible that the acidic condition of the stock will cause solution of the nylon.

## Operating Details

The foregoing has been a brief description of the Bauer cleaner installation and a few of the details of operation. Now to the results in respect to the removal of dirt from western unbleached sulphite pulp. This discussion is not intended to go into the mechanics of particle separation by the centricleaner, as that has been covered in recent literature.

Dirt count as presented here is based on specks per gram of pulp with the

TABLE I

| | *Feed* | *Primary* | *Secondary* | *Tertiary* | *Combined Accepts* |
|---|---|---|---|---|---|
| *Consistency % o.d.* | | 0.78 | 0.25 | 0.29 | |
| Feed | | 0.75 | 0.21 | 0.12 | 0.56 |
| Reject | | 1.10 | 1.18 | 2.77 | |
| % of feed rejected | | 10.4 | 21.0 | 62.8 | |
| Pressure, p.s.i.g. | | 41 | 35 | 39 | |
| Freeness, C.S. | 720 | | | 670 (rejects) | 710 |
| *Dirt Count* | | | | | |
| Shive | 68 | 41 | 64 | 76 | 52 |
| Dirt | 143 | 89 | 300 | 600 (est.) | 102 |
| % Reduction | | | | | |
| Shive | | 39.6 | | | 23.5 |
| Dirt | | 37.8 | | | 28.6 |
| Total Rejects % | 1.37 | | | | |
| % Ash, Rejects | 1.09 | | | | |

division of dirt into shives and black dirt. Shives will include light and dark colored fiber bundles and possibly some of the inner and outer bark not readily identified as such. Black dirt is composed of the dark colored specks such as black knot, bark and process dirt including sand, scale, rust, etc.

### Dirt Counts

Dirt counts taken at frequent intervals, the past several months on pulp samples before and after cleaners indicate a removal of 15 to 25 percent of the shives and 25 to 40 percent of the black dirt. Though these values indicate a fairly large variation in the percentage of dirt removal, the actual spread has been much greater. Also, dirt counts carried over a period of several months have shown that the cleaning efficiency varies not only with the concentration of dirt in the feed stock but also with the character of the stock. Some accepts have had a lower count from a feed stock of high count than the accepts from a feed stock of a low count.

*Table I* is a set of characteristic data taken from a series of test points during normal operation of the cleaner system. It is noted there is a rapid increase of small black dirt as well as an appreciable increase of the number of shives in the accepted stock from the secondary and tertiary passes.

Actually, the dirt particles are rather small, with many having an estimated black area of less than 0.06 to 0.07 sq. m.m. Freeness drop across the cleaners is low, 10 to 15 c.c. Canadian standard with an original freeness of 700 to 720. The freeness of the tertiary rejects approximates the freeness of the accepts and has in some tests been slightly higher. This is due to the high content of the rejects of a short chunky fiber in addition to the somewhat spherical shape of hte dirt particles. Handsheets made with the tertiary rejects are difficult to form and have a low mullen and tear characteristics.

The Bauer cleaners, though not removing as much objectionable material as desired, have produced a cleaner stock with which to meet the quality specifications.

# *Drying Paper Faster*

Drying efficiency depends upon the ability of the dryer felt to take up water and to get rid of water—*the drying rate of the felt itself.*

Barrell Tour Boss L. D. Felts have a fast absorbing surface ply and fast vapor-eliminating surface—a double surface fabric with high capillary power. Note the close texture face surface above in contrast to the open weave back which offers approximately 30% greater evaporation area. The felt absorbs water faster—gets rid of water faster—improves paper-drying rate.

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## Stronger Conveyor Belt

### A Manufacturer's Report

Described as a super strength conveyor belt, the Super Ustex-Nylon belt has been introduced by United States Rubber Co., Rockefeller Center, New York 20, N. Y. The belt is designed particularly for handling heavy rough materials over long hauls.

According to the manufacturer, the belt utilizes a new type of cellulosic yarn which is treated chemically to give it more strength. It is said to be three times stronger than the strongest rayon belt fabric and three and one-half times stronger than the strongest cotton duck used in bels today. The only belt carcass material in its strength range is steel cord. Its big advantage over steel cord, however, is that it cannot rust or corrode.

The cellulosic yarn is used as the longitudinal or strength carrying part of the btlt fabric. Nylon, because of its shock absorbing ability and greater flexibility, is used as the crosswise fiber in the fabric.

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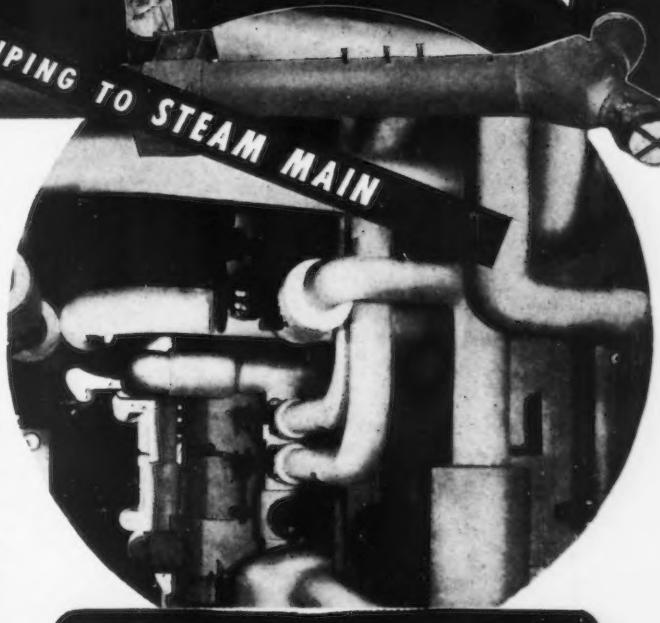

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# How Three-Roll Expander Unit Improves Felt Handling At John Strange Paper Co.

**This report, edited by officials of John Strange Paper Co., presents the experience of the mill that has used the Felt Preserver the longest.**

The designing of a Felt Preserver that utilizes three free-wheeling expander rolls, is a fairly recent development of the Mount Hope Machinery Co. The first unit was installed on the top felt of a seven-cylinder board machine at John Strange Paper Co., Menasha, Wis. (See *Figure 1.*) After more than two years' experience with the Preserver, the company reports that the unit has accomplished a number of improvements in felt handling and that all of the mill personnel are satisfied as to the value of the installation.

## What the Felt Preserver Does

Although single expander rolls had been applied to felts for several years to reduce some of the rough handling, it was still necessary to use worm rolls, whippers, conditioners, and much water to remove pulp from the pores of the felt. Mount Hope figured that what the felt needed was a scrubbing action like any piece of fabric that has been imbedded with dirt. It seemed likely that this action could be obtained by working the felt in and out lengthwise.

To accomplish this, a unit of three, free wheeling expanders was designed with one expander acting as a shrinker roll. The three expanders are set in a row with the first expander spreading the felt to full width, the second expander shrinking it down as narrow as possible without wrinkling it, and the third expander again spreading it out to the required width. Besides keeping the felt threads straight and controlling the width of the felt, the expanders can now work loose the pulp that has become imbedded in the felt without impairing the life of the felt.

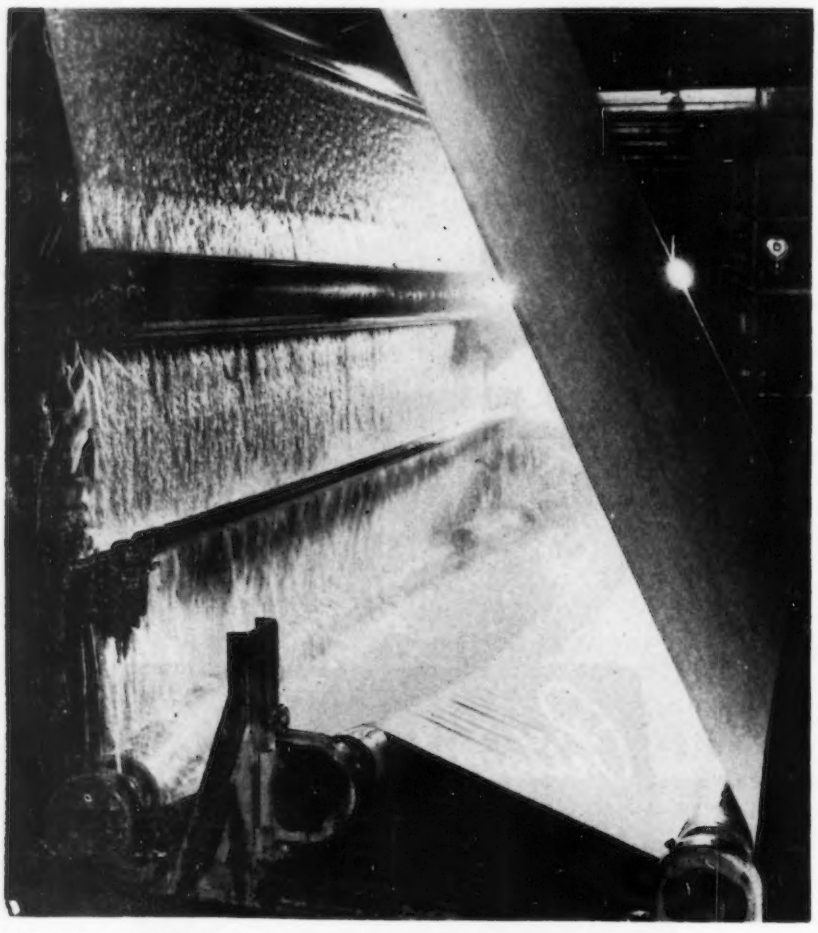

**FIGURE 1—FELT PRESERVER** in action on the top felt of one of John Strange Paper Co.'s cylinder board machines. The middle expander roll is vertically adjustable.

## Showers Required

To finish the job, showers are required to wash away the pulp that has worked out of the felt. The three-shower arrangement shown in *Figure 2* has been found best in most cases. Some changes in nozzle sizes and water pressure may have to be made for specific conditions. Also, there may be installations where a detergent, sprayed onto the felt ahead of the Felt Preserver, is required for maximum results.

## Mill Success

After two years operation of the Felt Preserver at John Strange Paper Co., the mill reports these accomplishments:

**1**—It keeps the felt open and soft on unsized stock, maintaining initial efficiency throughout its life.

**2**—It allows felts to operate on heavy weight sheets throughout their life.

**3**—It aids in keeping the seam straight.

**4**—It helps maintain felt alignment.

**5**—It contributes to felt life by eliminating need for whippers.

**6**—Because it reduces the lengthwise tension on felts, it allows use of narrower felts.

**7**—It saves water and time in felt washing.

A wide range of grades run on the cylinder machine in question. These include heavy liner, and many runs are quite short. Prior to installing a Felt Preserver, John Strange Co. lost considerable production time during changes from heavy to light grades after the felt was in service one week or longer. Now, such changes can be made with little or no lost time.

### Felt Life Lengthened

Records of felt life on this machine indicate that since the preserver was installed, the felts last on a conservative average of 15 per cent longer. Other advantages include elimination of down time for whipper maintenance and a drastic cut in the time formerly required for felt wash-ups.

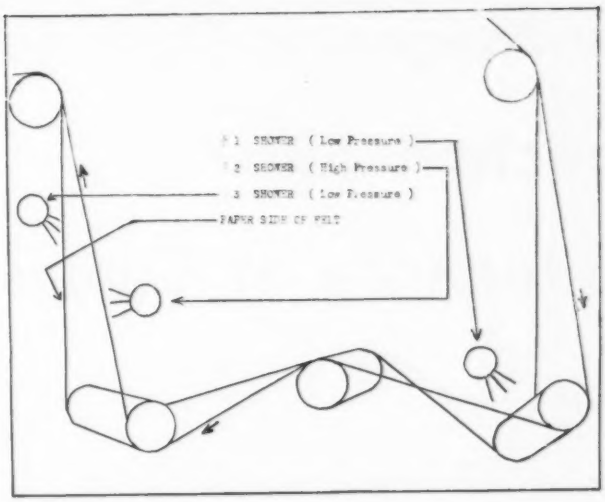


**FIGURE 2—RECOMMENDED ARRANGEMENT OF SHOWERS** is depicted on this schematic of the felt preserver unit. The No. 1 shower serves as a wetting shower to make the felt as wet and pliable as possible. The No. 2 shower is directed against the back side of the felt to remove the dirt that has been loosened by the successive stretching and compressing of the felt as it passes through the unit. This high-pressure shower also further loosens deeply imbedded particles which are subsequently removed by the No. 3 shower. The No. 3 shower is directed against the paper side of the felt.


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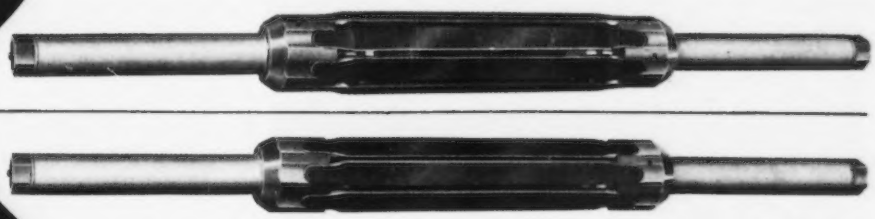

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# How Magnetic Particle Inspection Aids Maintenance at Camas

**D. M. Platt**

Project Engineer for Services, Crown Zellerbach Corp.

Mr. Platt is a graduate of Oregon State College with a B.S.M.E. and B.S.E.E. degree. He has been employed in various capacities in maintenance and engineering with Crown Zellerbach Corp. for 21 years. His present position includes general supervision of all maintenance, steam power, and electrical services.

In mill maintenance, one of our major problems is that of preventing the costly major breakdowns and the irritating and also costly smaller failures of older equipment which is now being operated far beyond its rated load and design speed.

One of the tools used in attacking this problem is mechanical inspection. Over a period of years, the Mechanical Inspection Dept. at the Camas (Wash.) Div. of Crown Zellerbach Corp. has grown and taken on increased responsibility in assisting the plant's Maintenance Department in the job of preventive maintenance. Skilled as we may become, however, in the art of mechanical inspection and in the maintenance of our equipment, we are still unable to prevent many of our failures. We are just learning to apply to mill maintenance some of the techniques used for years by equipment manufacturers for reducing costs by detecting and eliminating faulty parts in the process of manufacture. We refer particularly to magnetic particle inspection with equipment built by Magnaflux Corp. of Chicago.

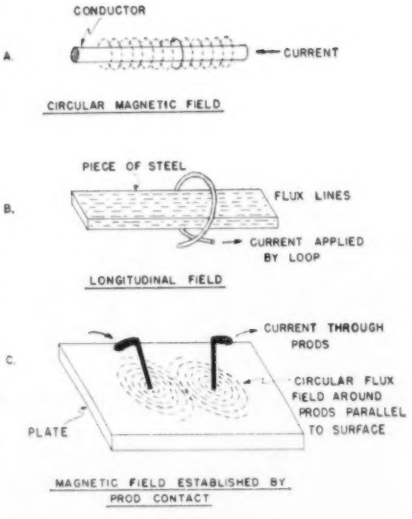



Figure 1

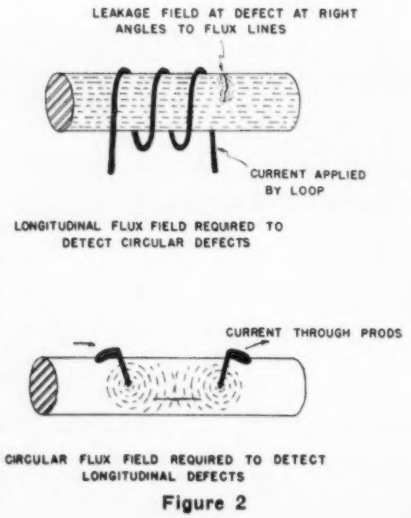

LEAKAGE FIELD AT DEFECT AT RIGHT ANGLES TO FLUX LINES
CURRENT APPLIED BY LOOP
LONGITUDINAL FLUX FIELD REQUIRED TO DETECT CIRCULAR DEFECTS
CURRENT THROUGH PRODS
CIRCULAR FLUX FIELD REQUIRED TO DETECT LONGITUDINAL DEFECTS

Figure 2

## Electro-Magnetic Phenomena

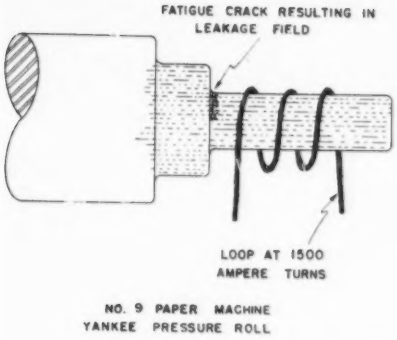
Before discussing some of the practical applications and potential uses of magnetic particle inspection, it would be well to review some of the basic principles of electro-magnetic phenomena.

1. Not all ferrous metals can be magnetized. Type 316 and similar stainless steels are in the non-magnetic group. Fortunately, however, most of the irons and steels used in present day mechanical equipment can be magnetized and can, therefore, be inspected by the magnetic particle method.
2. A magnetic field can be induced by means of an electric current and the lines of flux are at right angles to the current flow (See *Figure 1*).
3. Any abrupt change in the resistance in the path of the magnetic flux results in a distortion of the lines of flux. Leakage flux or flux outside the metallic path will occur. (*See Figure 2.*)
4. If finely divided particles of ferromagnetic material are brought into the vicinity of a leakage field, the particles offer a lower reluctance path to the leakage flux than does the air; hence, they tend to gather in the area of the distorted field and under favorable conditions will tend to outline its boundaries.

## Wet and Dry Methods

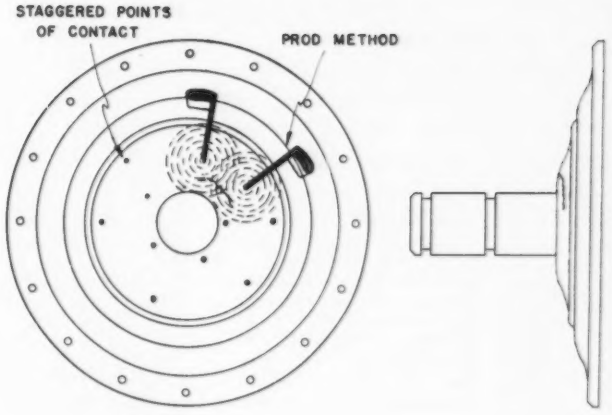
There are two techniques for the application of the inspection medium, the wet and dry methods. These assure effective inspection under nearly all circumstances. The wet method is especially adapted to the examination of finished parts such as bearings, journals, etc.; although it can be used on unmachined castings or forgings. The inspection medium is a light oil carrying the magnetic particles in suspension.

The dry method is particularly suited to the inspection of unmachined castings, forgings, weldments, etc. A powder of ferromagnetic particles is the inspection medium. The powder may be obtained in three colors—grey, black, and




←Figure 3

Figure 4→




PAPER MACHINE DRYER HEAD CRACKS

red; thus, providing the greatest possible contrast on various surfaces to be inspected. The powder is applied by means of a special air gun, a rubber bulb, or it may be dusted on by hand.

## Fluorescent Particle

The use of fluorescent coated ferromagnetic particles with black light is very helpful in looking for certain types of defects. A specially prepared paste is used with a low fluorescent oil to form the inspection medium. The application is similar to the wet method as outlined above, but the examination must be made under near darkened conditions, using a black light.

Indications appear as bright greenish-yellow lines of fluorescence resulting in greatly improved contrast against the dark background surface. This method is especially adapted to the location of flaws or defects on finished surfaces, threaded parts or irregular shapes. Lower magnetic field strengths may be used, thereby avoiding some non-relevant indications.

Many journal failures undoubtedly start with a surface scratch or machine tool mark which may not be noticed in ordinary visual inspection in the shop. Under fluorescent particle inspection, however, such a scratch or tool mark will appear as a stress riser.

## Types of Defects

A comprehensive study of the types of defects which may be located by magnetic particle inspection requires that we consider the history of the metal. The inspector should know what types of defects may have resulted from the various processes of manufacture. Non-metallic inclusions, shrink cracks and porosity are typical defects in cast iron. Seams or laminations in rolled products, laps and surface tears produced in forging, and quenching or heat treating cracks are some of the others. Defects caused by service failures or stress risers which may lead to such failure will usually be readily identified by the location, form and extent of the indication.

The ability to properly interpret and evaluate the indications found by any of the methods of inspection must be gained by study and experience. On two or three occasions it was possible, after removing a journal or other part from service, to complete its destruction and observe the actual extent of the crack as an aid to the inspectors in making future evaluations in similar cases.

The responsibility of the mechanical inspectors in magnetic particle inspection as in other phases of their work is limited to:

1—Inspection
2—Interpretation
3—Evaluation
4—Reporting

The decision as to the action to be taken regarding any particular indication rests with the maintenance supervisor, the head of the operating department concerned or the plant engineer.

## Scope of Use

The equipment for magnetic particle inspection has been in use at the Camas plant for about 20 months. During this time it has been used on many types of equipment. The most common use is perhaps the checking of roll journals including press rolls, wire and felt rolls, reel spools, and dryer rolls. Other items inspected include chipper discs, hydraulic barker log turning shafts, fabricated steel weldments, grinder shafts, dryer gears, beater shafts, electric truck axles, and many more.

Figure 5

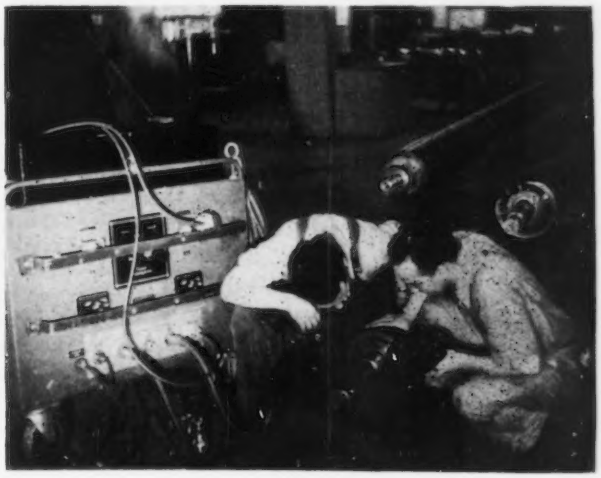


Figure 6

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Fig. 1

PAPER HYGROSCOPE (Lithographic Technical Foundation Model), indicates the difference, in terms of relative humidity, between the pressroom air and the paper stock.
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SURFACE MOISTURE INDICATOR, provides a simple, quick and accurate means of determining the moisture in paper.

Fig. 2

SURFACE PYROMETER, Fig. 2, indicates roll surface temperatures. It is made in the hand model or with an extension attachment to reach the hard-to-get-at places.

Fig. 3

pH RECORDER, Fig. 3, provides a continuous record of pH in aqueous solutions in the manufacture of paper. If pH of the stock is too high, an insufficiently sized sheet results. If pH is too low, not only is sizing uneven, but large quantities of alum are wasted.

Fig. 4

DIRECT READING INDUSTRIAL pH METER, Fig. 4, is especially designed and ruggedly built for plant use. All-electric, it is so simple that unskilled workers can easily use it.

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Figure 7

## Results Obtained

Soon after our equipment was received, the front journal broke on the Yankee pressure roll on our No. 9 machine causing considerable direct damage and resulting in several hours loss of production. The loss was estimated at $1,350.00. Repairs were made and a spare roll installed. The broken journal was removed from the roll and a new one installed. Before shipping the roll to be re-covered (the rubber was badly damaged), the back journal was inspected using the fluorescent particle and black light method. This journal was found to be cracked nearly one-third of its circumference (See *Figure 3*) and was also replaced. The probable future loss prevented in this case is quite obvious.

*Figure 4* shows the method of inspecting the face and fillet of a paper machine dryer head. *Figure 5* is a photograph of a crack in a head located by this method—note the marks indicating the points at which the prods were applied. This head was removed from service.

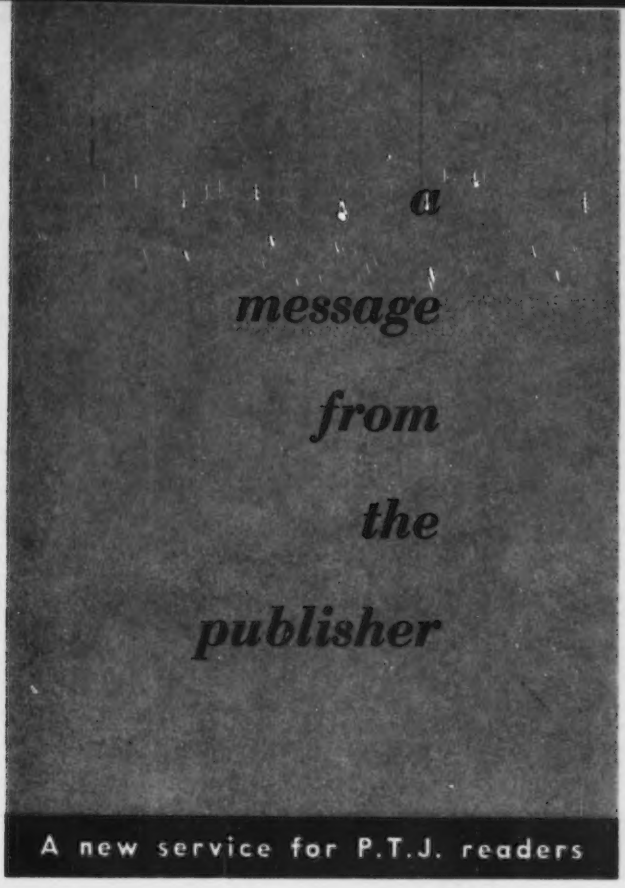
The Magnaflux equipment used and the actual inspection of a reel spool journal is shown in *Figure 6*. Several journals of this type have been removed because of cracks found by this method. In each case we feel that a probable failure was prevented. Many stress risers have been found on journals, especially near the fillets, as a result of careless machining. Each of these is a potential cause of failure which can easily be removed by careful grinding and polishing. This type of finding has caused the machinists to be more keenly aware of the importance of good fillets and careful finishing at points of concentrated stress.

*Figure 7* shows the application of the wet method, using prods, to the back of a chipper disc. This disc had failed in service due to the cracking of 3 of the 10 webs between knife pockets. The disc was removed from the shaft for welding, was sandblasted and inspected using the dry powder and prod method. The red powder used showed excellent indications and cracks were found in 4 additional webs. None of these cracks were visible to the eye without the use of magnetic particles. The disc was repaired, stress relieved, and put back in service. The inspection shown in *Figure 7* was made after the disc was back in service several weeks. This will be repeated periodically to detect any failure following the repair.

## Conclusions

We all know that equipment will not last forever, and we cannot afford to have breakdowns which cause unscheduled downtime on the machines and loss of production if they can be prevented. Our experience indicates that magnetic particle inspection can be of considerable value in preventive maintenance as a supplement to a regular program of mechanical inspection. A part of its value will depend on the extent of the records maintained and the schedules developed for periodic inspection.

Acknowledgment is given to the very valuable assistance of Messrs. Jack Krank and Sidney Pierce of our Maintenance and Mechanical Inspection Departments in the preparation of material for this article.

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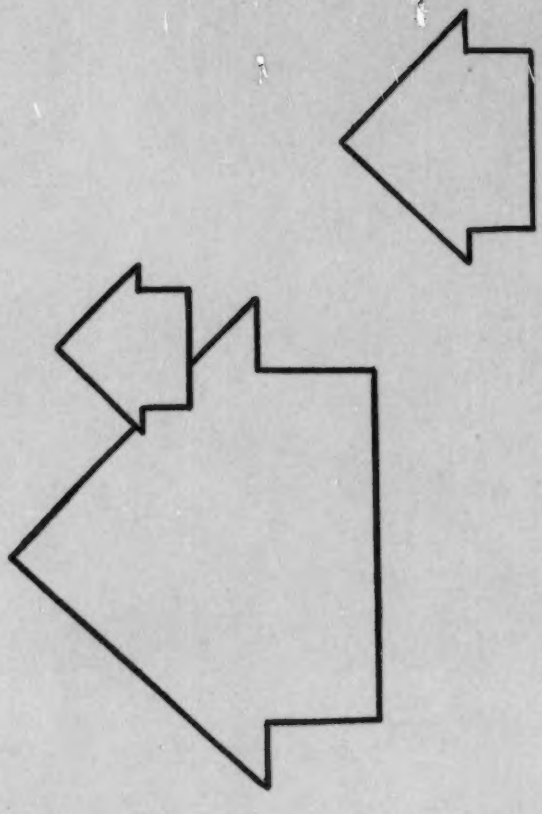

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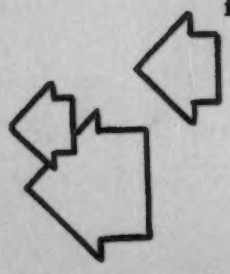

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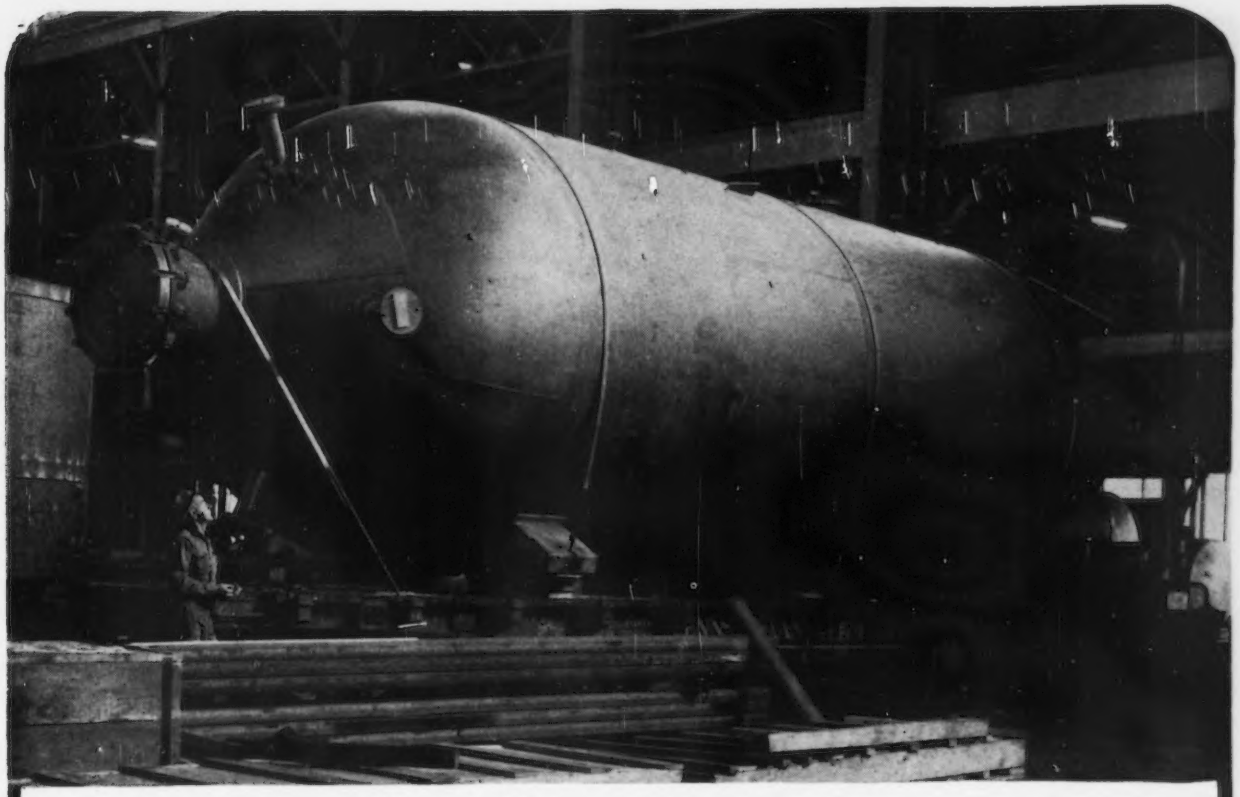

# Painstaking care revealed in fabricating HUGE DIGESTERS

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This gives you an idea of the kind of work Graver does. It is one of nine digesters for a new southern pulp mill, constructed of type 316 extra low carbon stainless clad on a backing of SA212 Gr B firebox quality carbon steel.

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# Can Mechanical Barking Aid in Northern Hardwood Utilization?

**Important data on the economical barking of log length hardwood has been collected by Champion-International Co. Their experience with the Anderson Mechanical Barker is a pioneering effort of high value to the industry.**

As told at the mill to editors of Paper Trade JOURNAL.

### Reasons for Trial

When the cost of purchased sap-peeled pulpwood from distant rail sources rose to a point where it was forcing into marginal and submarginal operation, the soda pulp mill of Champion-International Co., Lawrence, Mass., the company sought means to utilize local hardwood species. Eventually a woodyard was established at Bow, N. H. for concentrating log length pulpwood.

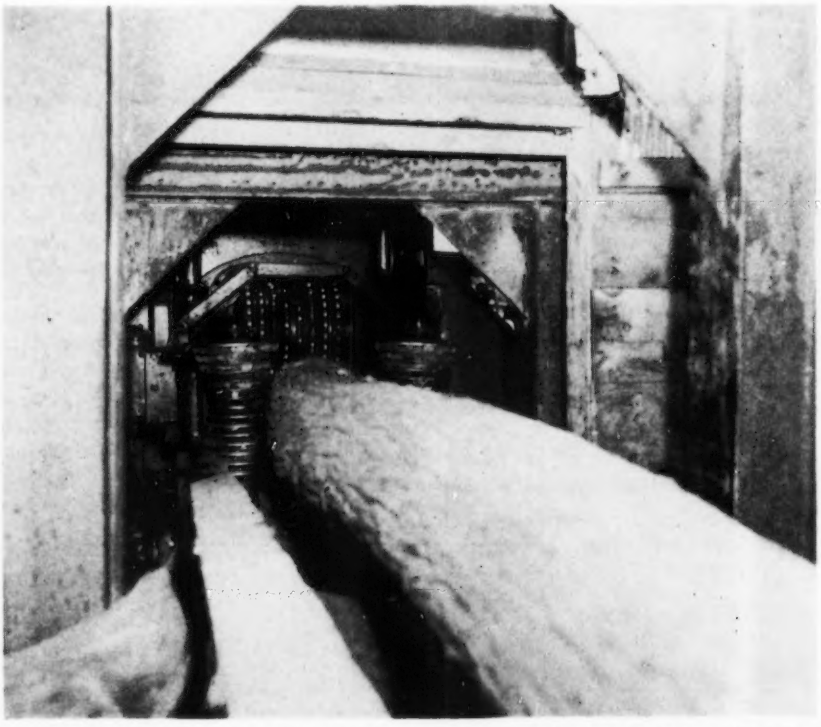
The management at Champion felt that profitable operation of this woodyard would largely depend on obtaining a relatively inexpensive barking machine that could handle the rough, irregular logs characteristic of northeastern hardwood stands. To furnish a steady supply of barked wood, the barking equipment also would have to be capable of efficient operation in the cold months of winter.

It was decided that a mechanical barker of the type developed in Sweden and in successful operation in Europe would be the best bet. These barkers not only were designed for efficient year-round operation but were obtainable at much lower initial cost than either a tumbling drum-type barker or a hydraulic barker. About 18 months ago, Champion-International installed a pneumatic type Anderson Debarker at the Bow woodyard near Concord, N. H. A small building was erected to house the debarker and the necessary air compressor. Roll-type log conveyors were provided on both the infeed and outfeed of the unit. A drag saw was installed to cut the peeled logs into four-foot lengths.

### Operating Details

The pneumatic debarker is basically the machine developed by Erland Andersson of Sweden and sold in this country by Soderhamn Machine Mfg. Co., Talladega, Ala. The Champion machine is designed to handle logs up to 20 inches in diameter and upwards in length from a minimum of 8 feet. Its original 20 hp. drive has been replaced with a 30 hp. unit.

The debarking chamber of the unit consists of a revolving ring in which are set eight stellite-tipped tools. The tools, moving radially under pneumatic pressure controlled by the machine op-



**VERTICAL GUIDE ROLLS** and horizontal feed rolls hold log rigid as it enters barking chamber.

erator, are applied to the log as it is fed through the ring. Each tool can move independently of the others. Sufficient pressure is applied to prevent the tools from riding over the bark but not enough to force the tool into the live wood. As the bark is "squeezed" off, it is cleared from the chamber by a foot-operated air blast.

The logs are fed into the chamber and held rigid by a pair of horizontal feed rolls and a pair of vertical guide rolls on each side of the chamber. These rolls are synchronized and can be opened and closed with separate controls. A single operator manipulates all controls from a position along side the machine, from which he can observe the action of the tools.

### Performance Report

William C. MacAdam, Manager of Woodlands Division, Champion-International Co., reports that the performance of the B-20 Anderson machine has in general been very satisfactory. Although early trials produced trouble with the feed mechanism, this has been remedied. The supporting yoke and pivot arms of the feed rollers on the 20-inch models had been designed in keeping with relatively smooth and straight European timber. This construction was not rugged enough for continual handling of heavily knotted and crooked New England hardwood. Now that the feed mechanism has been reinforced, this trouble has been eliminated.

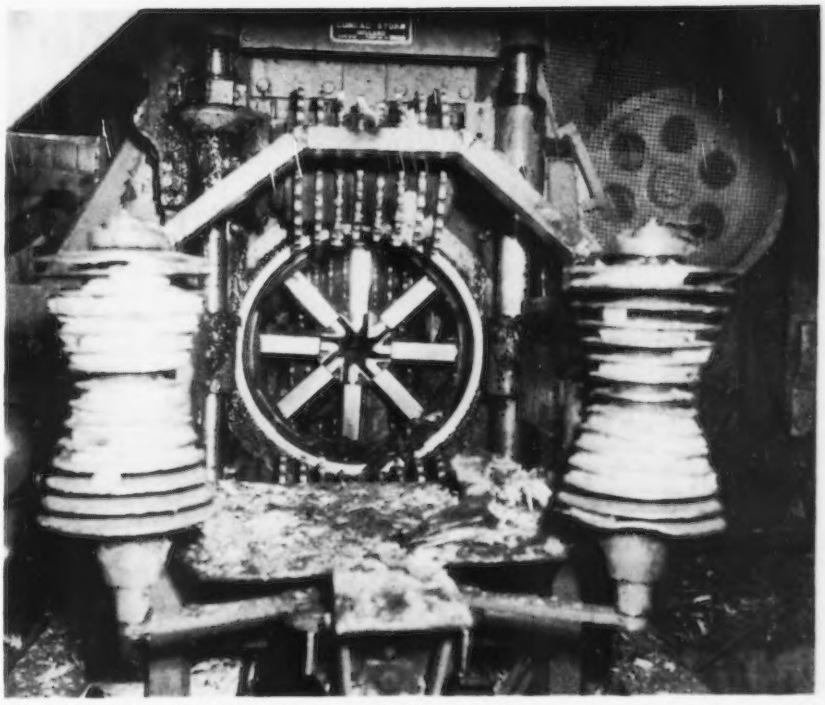
Bark removal is extremely effective even on frozen logs. This is accomplished with no wood loss. It is estimated that equally-effective winter-time barking (on the scale required by Champion-International) by drum or stream barkers, if attainable at all, would require a capital outlay in equipment that would prohibit economical operation.

At the present time the mechanical debarker is handling log length birch, beech, maple, and some oak. The unit is designed to debark at a range of feed speeds from 30 to 120 feet per minute to meet varying barking conditions. Of course, the actual volume output is governed largely by the size and irregularity of the logs being handled.

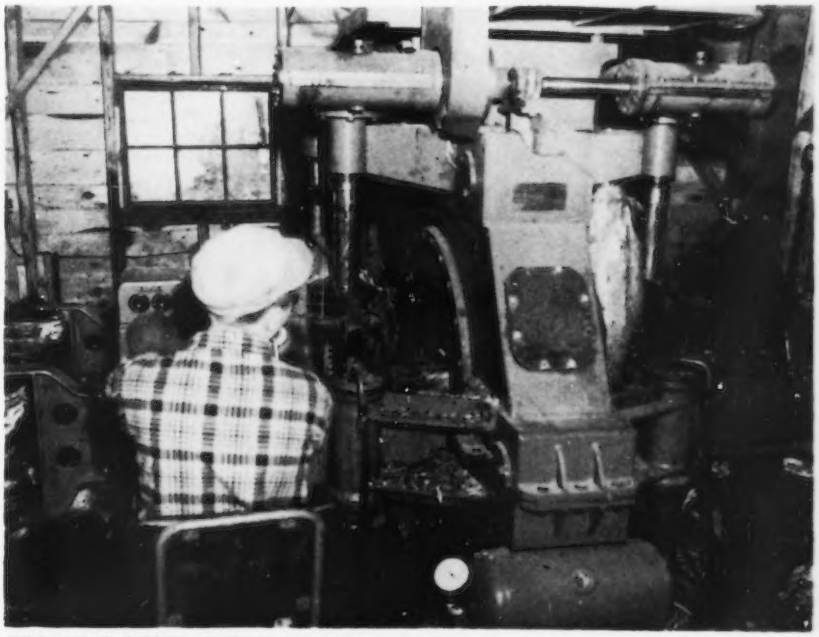
People at Champion estimate its capacity at 10 to 12 cords per hour. It has not been possible to determine the actual top sustained capacity, since the present facilities for handling and storage of logs at the Bow woodyard are not adequate to handle the full output for sustained runs. The daily production of barked logs is therefore held considerably below the capacity of the debarker.

### Future Plans For Bow

Now that the company is convinced that the Bow operation is economically possible, fully mechanized handling and sawing equipment is now being installed. The plans call for the extension of the log roller conveyors, the installation of a conveyor belt to receive the peeled logs and deliver them to an automatic slasher loader. A three-saw slasher with 60-inch saws will be erected. Cut wood from the slasher will pass to another conveyor belt that will carry it to storage areas. A spur track will be run into the yard to permit log handling by rail car to the Lawrence, Mass. pulp mill. When completed, the expanded operations will furnish 70 barked cords a day, the full requirement of the pulp mill. No reliable figures on the power cost per cord are available, but it is known to be very low.



**PNEUMATICAL-CONTROLLED BARKING TOOLS** are shown from the outfeed end of the Anderson machine.



**FROM HIS SEAT AT THE CONTROL PANEL,** the operator can watch the action of the tools.

# How The Beta-Ray Gauge Works as a Control Instrument for Extrusion Laminated Polyethylene Coating

**James B. Sisson**

Plastic Coating Dept., St. Regis Paper Co., Carthage, N. Y.

In October 1953, St. Regis installed on its 90-inch extrusion laminator at Carthage, N. Y., an AccuRay Gauge built by Industrial Nucleonics Corp., of Columbus, Ohio. This instrument is known more commonly as a Beta-Ray Gauge. Similar instruments are built by a number of companies. The selection of this particular model was based upon proven performance, evidence of careful design and engineering, but principally because this was the only instrument available at the time of consideration which, to the knowledge of parties concerned, could be obtained in an "O-frame" mounting of the desired width. Most instruments installed up to that time were "C-frame" mounts which when built to traverse back and forth across a web require floor (or overhead) space at one side of the web equal to its width. Measurement of less than the full web width was not felt desirable since major variations were known to exist across the width of the extruded film for reasons which will shortly be made known. The "O-frame" design permitted full web scanning with small floor space requirements.

## The Extrusion Process

Before exploring the operation of the Beta-Ray Gauge as a control instrument, the extrusion lamination process should be described, particularly the aspects which affect control methods.

The extrusion lamination of polyethylene to paper is a process which has been in existence for about five or six years. It was developed experimentally by Du Pont and the first commercially coated paper was sold by St. Regis Paper Company in the fall of 1949.

In this process, a conventional thermoplastic extruder melts the polyethylene and forces it continuously through a sheeting die to form a film at a temperature of 450-550 degrees F. This hot film is pressed between a sheet of paper and a water cooled metal roll by a rubber pressure roll. The film adheres to most papers well enough to pull fibers and is cooled well below its melting point by the cooling roll from which it is released. Thus, a good protective film is laminated to paper with no adhesives or solvents used anywhere in the process to add costs or hazards.

This process does not automatically place the converter in the land of milk and honey, however. A quality paper coating must be uniform in thickness throughout to provide consistent protection, smoothness, dielectric properties, or almost anything that can be expected of a paper coating.

The die for polyethylene sheet formation *(See Figure 1)* may be considered as a pipe of irregular dimension mounted horizontally. On the top side equidistant from each end is the entry pipe from the extruder. On the bottom side of this pipe is a slot extending its full length. At the bottom of this slot is a slit orifice whose width is controlled by die blades. These die blades are made of hard but flexible steel of about ½" x 4" in cross section. The gap between them is adjusted by alternate "pusher" and "puller" bolts spaced at four to five inch intervals. Dies have been constructed to make a sheet of polyethylene up to 120 inches wide. They must be heated electrically to temperatures of 550-600 de-

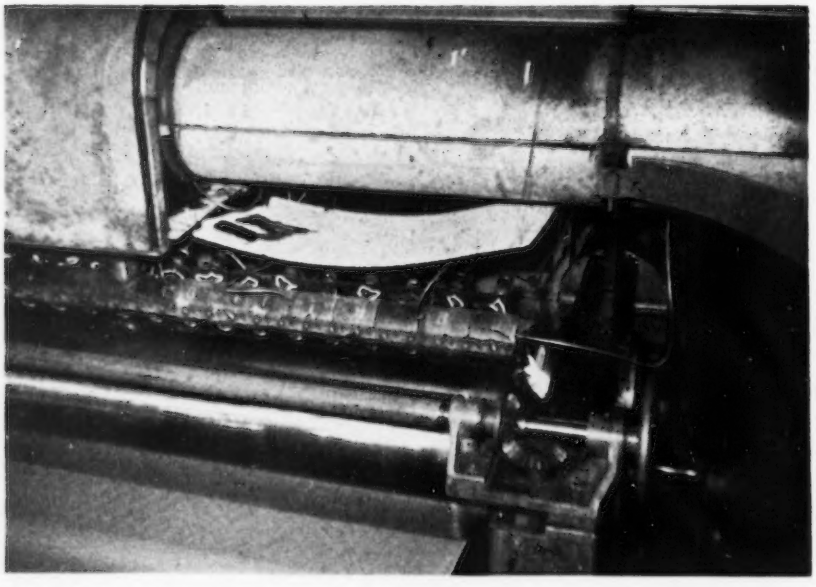


FIGURE 1 — Portions of die, barrel, and laminator rolls of St. Regis Extrusion Laminator. Numbers occur on heater bands on the die.

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grees F. by external band heaters whose surface temperatures may exceed 1000 degrees F.

## Complex Adjustments

Obviously, from this description, we have a condition where unlike metals, physically held together, are heated from one side. Warp is inevitable; no matter how carefully die blades are adjusted when the die is cold, corrections must be made when the die is hot. Additionally complicating this adjustment problem are the characteristics of polyethylene coming from the die. An even film may only be obtained in one case by having the ends of the die as much as 70-80 degrees F. cooler than the center. Polyethylene in the presence of air at 600 degrees F. decomposes and the charred products slowly accumulate on the edges of the die blades. Resins vary from lot to lot and from type to type in viscosity and flow characteristics. Adjustments to correct film weight are therefore required at short intervals.

## Thickness Control Problems

Before explaining the operation of the gauge, some consideration of coating dimensions should also be taken. St. Regis coats primarily multiwall bag kraft, and kraft specialties for freezer wrap, food pouches, etc. Polyethylene coatings range normally from 6 to 30 pounds per ream (3000 sq. ft.) or 0.0004 to .0020 inches in thickness. Considering the six pound coating it is easily calculated that an error of one pound per ream in coating weight is a 16 percent error and that the change in thickness caused by such an error is less than 0.0001 inches.

Initially, control was done by "miking" the coated sheet and by noting weight differences between uncoated and coated papers. Shortly, it was found that paper weight variations were greater than film variations, making measurements of the whole coated sheet unsatisfactory.

The next control procedure was to remove the paper from a coated strip taken across the width of each roll, caliper the film at short intervals with a precision micrometer and check readings periodically against film weights obtained with an analytical balance. This procedure was quite effective but time consuming. On a start-up with polyethylene at 40-50 cents per pound, large amounts of unacceptable and highly expensive material could be made before the film was adjusted to satisfactory uniformity.

## Beta Ray Characteristics

The Beta-Ray Gauge is rather simple in concept but it is a complex electronic instrument in its effective form. Radioactive thallium or strontium available from the Atomic Energy Commission is the key to the operation of the instrument. These two, of the many radioactive elements available, have an effective length of life and radiation characteristics best suited for a measuring instrument. They are sources of continuous radiation energy in the form of beta rays or high speed electrons. This energy is constant for all practical purposes over short periods of time. Characteristic of the beta ray is the fact that it will penetrate most substances but that its energy is reduced in so doing in proportion to the mass per unit area and the average atomic number of the material penetrated.

The energy of the source is received by a special ionization chamber mounted about two inches from the source. By proper amplification, changes in the energy received as the amount of material between the source and the receiver varies, are indicated by a recorder in terms of pounds per ream or any other desired units. It should be stressed at this point that the instrument measures directly only weight. Thickness is easily obtained when materials such as metals and plastics of constant density are measured. However, paper weighing 50 pounds per ream will give the same reading whether its caliper is 5 mils or 3 mils. Apparent density has no effect. The instrument recorder is so sensitive that changes in basic weight of 1 pound cause a ½ inch deflection that is visible for 50 feet. At this sensitivity, the full scale chart covers plus or minus 10 pounds from specification.

## How Measurement is Taken

At St. Regis the installation consists of two gauges. One gauge measures the weight of the raw paper. The second measures the weight of the coated paper. The two gauges can be adjusted for any combination of paper and coating so that the two lines on a duo-pen recorder chart which represent the uncoated and coated paper are superimposed when the correct weight of coating is being applied.

At any given instant the gauge measures an area of approximately two inches in diameter. *Figure 3*, a view of the source and receiver mounting, shows an indicator and numbered sections on the housing. The indicator gives the position of the gauge and the numbers correspond to similarly numbered heater bands on the die. This visual system simplifies adjustment procedure. Since the width of a moving web measured at any given position is only two inches, it is possible to note and correct errors in relatively narrow strips of coating. Such correction laterally is possible because adjustment centers made up of the die blade bolts are less than 5 inches apart.

Total average coating weight is primarily selected by changing the web speed, since the rate of plastic extrusion is held as high as possible for most coating weights and is therefore relatively constant. Although this installation only measures and does not control, automatic web speed control to maintain constant coating weight is available and could be a valuable feature.

The installation described includes an

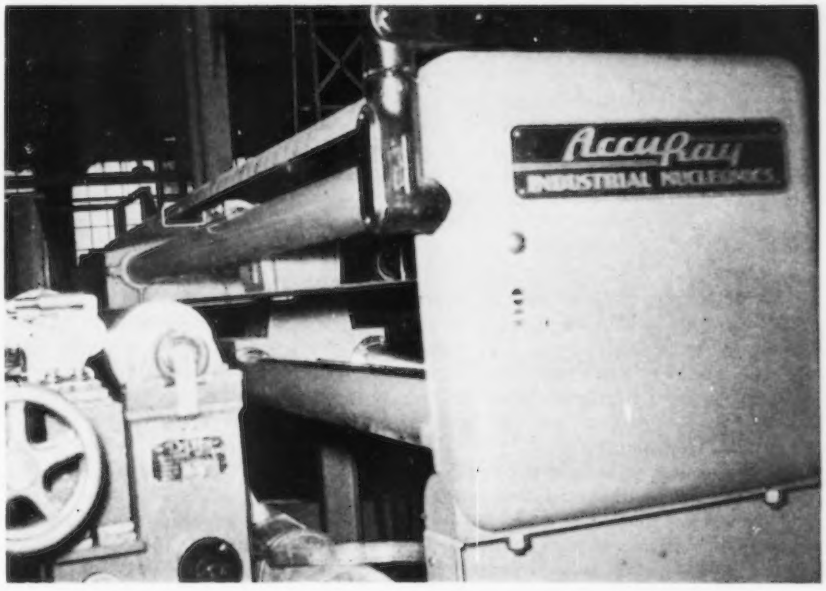



FIGURE 2—AccuRay source and receiver mount view shows polished round carrier rails.

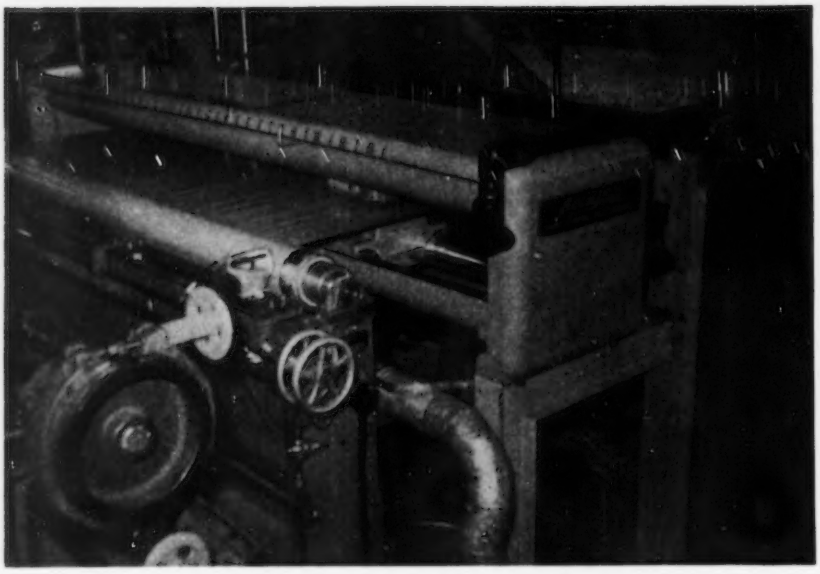


FIGURE 3 — AccuRay source and receiver mount view shows position numbers and indicator corresponding to the numbers on die heater bands.

automatic standardization feature in the circuits which operates at ½ hour intervals and virtually eliminates the need for periodic checks against standard samples.

Many will say, "We have read about and seen Beta-Ray Gauges, but are they really worth the cost?" The experience of St. Regis at Carthage indicates that in a good spot for such a control instrument, the results can be indeed good. This application is less complicated than many, since the polyethylene applied involves no moisture or solvent loss from the paper or coating. It is a direct addition measurement, where no calculations of losses have to be considered.

### Cost and Quality Advantages

At the end of six months it is calculated that the instrument has paid for itself in direct cost reduction and at the same time produced an improvement in average coating quality which may be of high dollar value but is not easily measured.

The direct cost reduction can be attributed to:

1. Shorter adjustment time to start producing acceptable coated paper. This "set-up" time is easily cut in half, since the operator can watch the effect of a coating weight adjustment while he is making it. Over-correction and under correction are eliminated.

2. No tear outs or samples are required during the set-up, thus reducing splices and conversion time.

3. Making coating weights heavier than specification for "safety" no longer occurs, since "thin spots" can be quickly detected and corrected eliminating any necessity for costly overweight.

4. The base paper weight is measured; consequently we have been able to give our suppliers records of the exact manner in which basic weight variations occurred enabling them to spot troubles and produce a more uniform base sheet.

### Maintenance of Gauge

The disadvantages are a high initial cost compared with mechanical measuring instruments and the fact that like any complicated device it needs attention to give the best performance. It is estimated that a skilled electrician devotes ½ hour to 1 hour per day in maintenance, adjustments and repairs. The manufacturer provided one week of instruction to this man at the time of installation.

The total time which the instrument has been out of order is less than 48 hours in the six months, and the repairs were easily made by the trained electrician. No indication of inaccurate measurement has occurred although constant checks are employed.

### Final Judgment

The Industrial Nucleonics AccuRay Gauge, based on the results in this installation, appears to be a highly satisfactory control instrument. It is worthy of consideration in any case where continuous paper or paper coating measurement is essential. Many cases, for instance an installation on a paper machine for basic weight and moisture control, will require interpretation of more results than the one described. However, the writer has visited several installations of this type, and in all cases the opinions of the people concerned were favorable.

## Slime Control Agent For Paper Mills

### A Manufacturer's Report

Slimodym is a new slime control substance now being offered by United States Movidyn Corp., 863 N. Orleans St., Chicago 10, Ill. It is said to kill on contact and prevent further growth of a variety of sporeforming and non-spore-forming bacteria, fungi, and yeast microflora found in paper mill systems.

It is described as a composition of very finely dispersed silver alloy and an active organo mercurial in a liquid carrier. Although dark brown in color, it will not impart any color or odor to the paper stock. It is also said to non-corrosive, non-odor-producing, and non-toxic in use. It does not reduce the effectiveness of alum nor effect the p H of the system.

Supplied in non-returnable polyethylene containers each containing 50 pounds of the slimicide, the material is applied by pouring into the system in prescribed dosages, either by "shock" treatment or continuous addition.

The manufacturer reports the following test results:

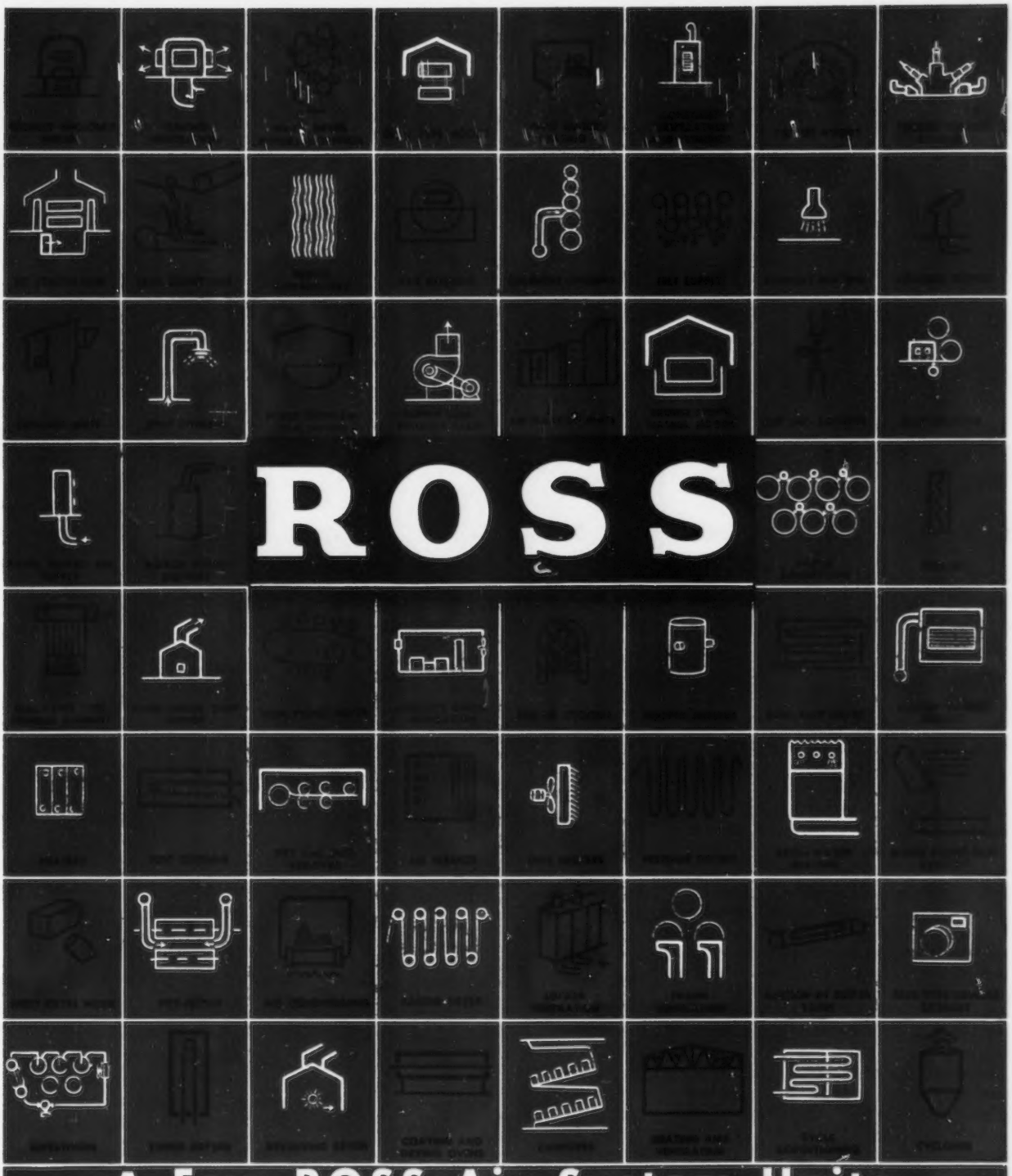
In effluent white waters taken from typical paper mills, this slimicide, in concentrations of one part to 100,000 parts of the water, decreases the bacterial population of the water by from 99.9 to 100 per cent in four hours. This is within a pH range of 4 to 6.5. In concentrations of one part to 1,250,000 parts of water, and pH's from 4 to 5, a 99 per cent kill has been measured in four hours. With pH's ranging from 6 to 6.5, and the latter proportion of the slimicide, the kill averages 90 percent reduction in four hours. Tests on sterile water, artificially inoculated with the micro-organism, Aerobacter aerogenes, reveal a 100 per cent kill within four hours, with a pH of 7, and with proportions of the slimicide as low as one part to 32,000,000 parts of water.

## Stir-In Type Vinyl Paste Resin

### A Manufacturer's Report

Monsanto Chemical Co., Plastics Div., St. Louis 4, Mo., has developed a stir-in type vinyl paste resin which can be used for paper coatings. The product is known as Opalon 410.

The resin is said to have excellent dispersion characteristics and to blend quickly with plasticizers. Being a stir-in type of resin, the material needs no milling or grinding during compounding.

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# How the Modern Stuff-Maker Improved Sheet Formation At Columbia River

**Allan G. Strang**

Technical Director,

Columbia River Paper Mills,

Vancouver, Wash.

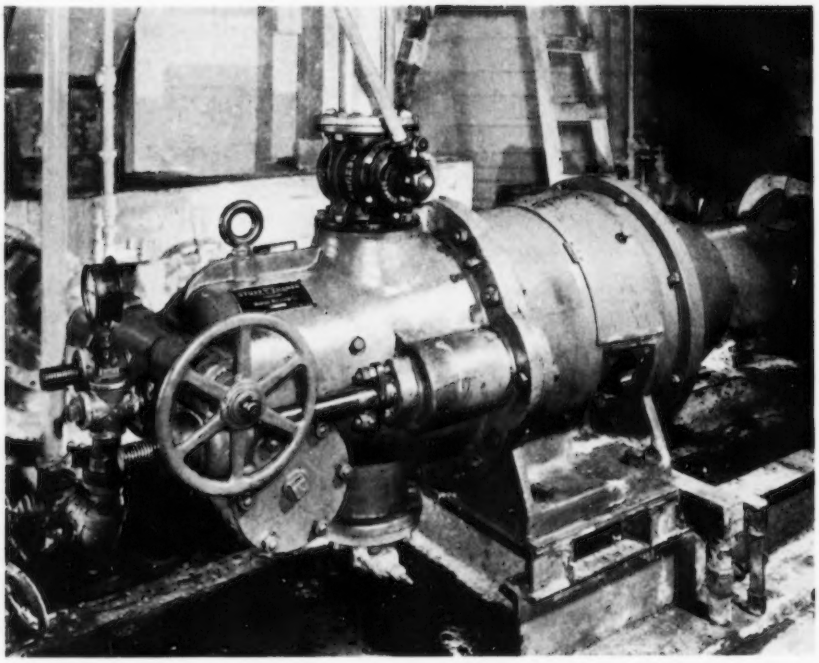


FIGURE 1 — This Morden Stuff-Maker is now refining stock immediately ahead of the paper machine at Columbia River.

This paper deals with the operation of the Morden Stuff-Maker and its application in the manufacture of papers using bleached sulphite as the pulp furnish. Paper grades consist of bonds, envelope, waxing stock, wrapping, and waterleaf.

This refiner has been in operation approximately one and one-half years at Columbia River Paper Mills in Vancouver, Wash., on a paper machine system producing from 5000 to 6000 pounds of paper per hour. The original flow diagram was similar to that shown in the upper diagram of *Figure 2* with the exception of the Stuff-Maker.

Not being satisfied with our final product from the paper machine, it was deemed advisable to improve our stock refining arrangement. Factors considered were:

1—finished product formation
2—production rate
3—finished product specifications
4—power consumption
5—spare requirements

The first item is definitely the primary reason for improvement.

## First Trial

A Morden Stuff-Maker was added to the flow system as is noted in upper diagram of *Figure 2*. Results, however, were not impressive. More refining was possible, but our desired formation im-

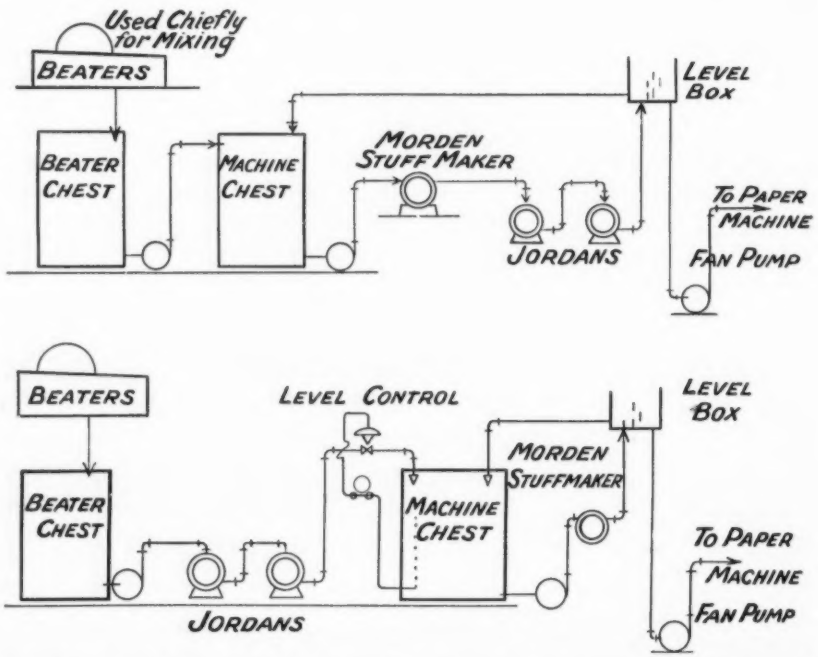
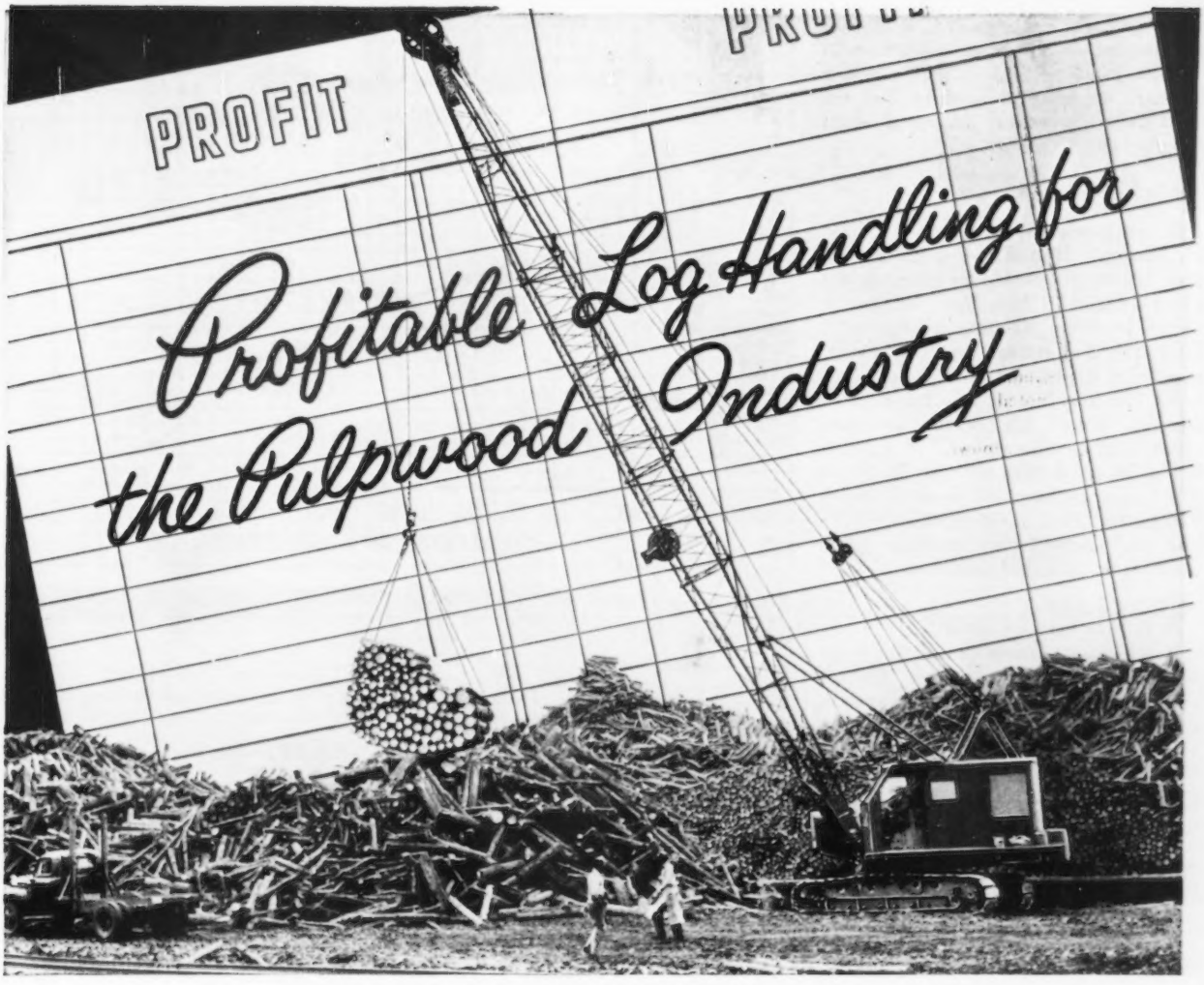



FIGURE 2 — Originally installed ahead of the jordans (upper flow diagram) the Stuff-Maker was later moved to the final position in the stock preparation flow (lower diagram), where it improved sheet forming characteristics.

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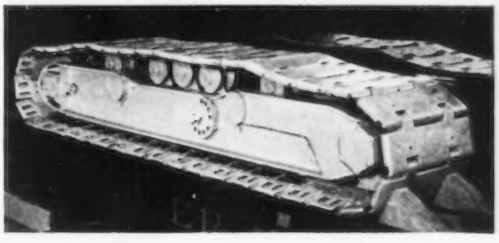

*Use of long crawlers, with shoes 44" wide (shown here on a rail car ready for shipment), gives the MARION 93-M pulpwood crane a bearing pressure of only 9½ lbs. per sq. in.*

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provement was not obtained. While experimenting on the paper machine with various jordan, Morden, and machine settings, we noted indications that the Stuff-Maker possessed improved sheet forming characteristics.

### Second Trial

A new flow diagram was then arrived at, using the Stuff-Maker as the last refiner for the stock before going to the paper machine. This flow diagram is shown in lower diagram of *Figure 2*. Using this flow system, we could observe a decided improvement in sheet formation. We also noted that for a given freeness drop, this refiner consumes about half the horsepower of that required by the Jordan refiners. In *Figure 3*, a typical performance graph is shown. Production rate is 5000 pounds per hour, and the paper is an envelope grade made from bleached sulphite.

### Final Appraisal

Specification tests on the finished product can be changed as desired, for this refiner responds well to various control settings. Due to the lower power requirements and improved sheet formation, indications are that the Morden Stuff-Maker is an excellent refining instrument.

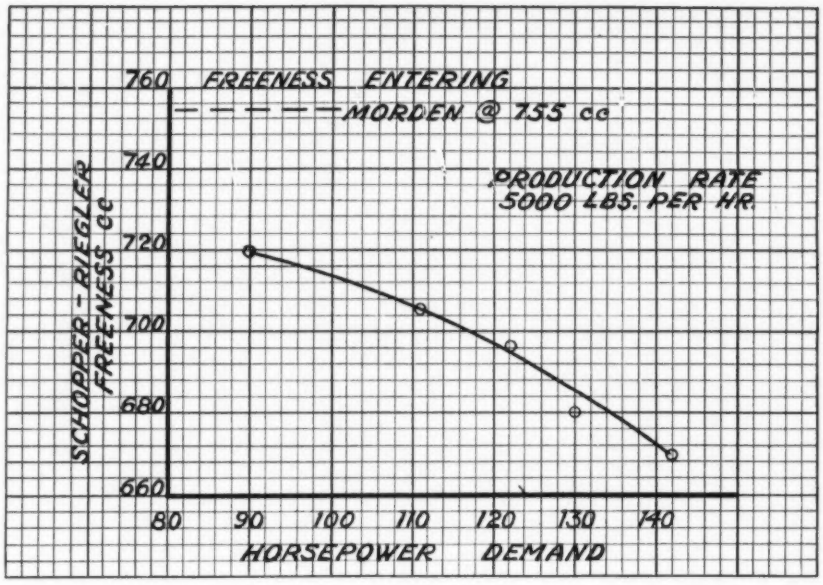



**FIGURE 3** — Typical performance graph of the Stuff-Maker showing relationship between freeness and horsepower demand at a production rate of 5000 pounds per hour on bleached sulphite envelope stock.

## Fast Setting of Coatings With Far-Infrared Panels

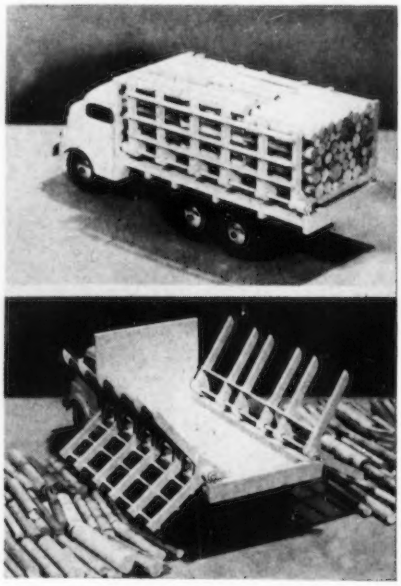
### A Manufacturer's Report

Chromalox Radiant Panels for rapid heating of web materials with far-infrared radiation are reported to be in successful operation in 13 U. S. paper mills and converting plants. The panels are manufactured by Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa. When applied to setting paper coatings on machine, the panels are said to save up to 85 percent drying time over former convection drying methods.

According to the manufacturer, one mill is setting coating on machine at 600 feet per minute on a 200-inch sheet with only two seconds exposure to far-infrared. Another mill sets coating on machine at 500 feet per minute on a 48-inch web of 30-pound stock in 0.84 seconds exposure.

It is also reported that still another mill, using this method to preheat the sheet ahead of the conventional dryers, has found that one 66-inch radiant panel of 15 kilowatts input can replace one conventional dryer in heating ability. In addition to permitting faster coating production, the units are said to eliminate picking and rewinding and to offer extreme uniformity of radiant intensity that is non-color sensitive and glareless.

Standard panels are available in four models varying in length (48″ to 66″) and number of elements.



## Unique Pulpwood Unloader Being Developed

A pulpwood unloading device and technique, designed and patented by Donald B. Kilpatrick, 5163 Montclair Ave., Montreal, Que., is now being considered for quantity fabrication by a prominent truck manufacturer. It is a rack accessory applicable to any truck, trailer, or railroad flat car.

The essential structure consists of two right angled racks which supplant the conventional side stakes and retain the load in transit. No chains or load retaining accessories are required, the load being held by the action of its own weight on the horizontal members and the closed hydraulic circuit. Although the unloading action is initiated hydraulically, the device utilizes the natural outward rolling energy of the wood plus gravity to perform most of the work. Clean dumping is assured by the overlapped and sweeping action of the horizontal members during rotation. To accelerate initial departure of the load from the vehicle and to provide clean dumping with maximum depth of load, the vertical struts retract telescopically (i.e. shorten) automatically during rotation. This feature is not presented in the model shown in the photographs.

Further data on this development is contained in Release #178, available @ $.30 from American Pulpwood Assn., 220 42nd St., New York 17, N. Y.

# NEW EMULSIFIABLE WAXES— *LOWER PAPER-SIZING COSTS*

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We also manufacture finished emulsions for increased *Grease-Proofness,* and are equipped to develop special emulsions to fit your particular needs.

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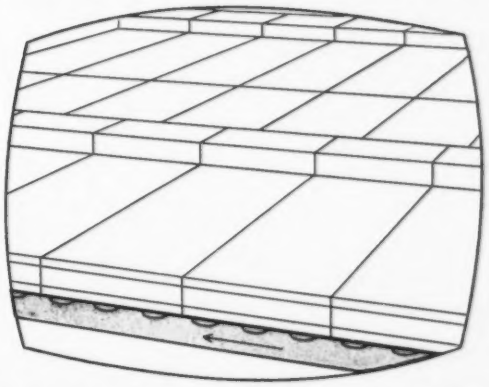
# A NEW PROVED WAY TO BOOST ON-MACHINE COATING CAPACITY



## CHROMALOX Far-Infrared PANELS

Speed up on-machine coating capacity and avoid rewinding! Chromalox Electric Far-Infrared Radiant Panels heat-set coating *without contact* and eliminate picking.

One mill is setting coatings on 200-inch paper, on machine, at 600 feet per minute with an exposure time of two seconds. Another mill is setting coating on 30-lb. basis sheet in 0.84 seconds at 500 feet per minute.

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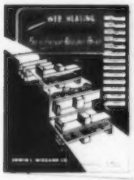
CHROMALOX Far-Infrared Panels are heat powered with shockproof, splashproof metal-sheathed tubular elements. Panels up to 24" x 66" can be grouped to radiate high intensities uniformly over the widest webs. Output is variable from 4 to 100%. Mechanically and electrically complete, ready to install on circuits up to 600 V.



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# Modern B-C Reel-Winder Solves Problems At Bloomer Bros.

## As told at the Mill to Editors of Paper Trade JOURNAL

Bloomer Bros. Co., Newark, N. Y., makes about 80 tons of its daily box board requirements on its own six-cylinder 112" board machine. About 60 per cent of this production is sheeted at the dry end of the machine in preparation for converting into boxes. The remaining 40 per cent, however, has to be reeled and rewound in jumbo rolls.

A little less than two years ago, the management of Bloomer Bros. decided to replace its antiquated reel with a modern unit, and they needed an upright reel that could maintain accurate tension on the sheet over a long span, from the calenders over the top of the cutter and across some twenty feet of vacant floor area. To accommodate these conditions, Black-Clawson Co. designed a new style upright reel-winder combination with the very latest devices for exact tension control. See *Figure 1*. The combination unit was subsequently installed along with a standard 104-inch #18 Camachine winder stand.

After more than a year of operating experience with the B-C reel-winder, Samuel D. Hodge, superintendent of the board mill, reports complete satisfaction with the performance of the unit.

### Construction Features

The two-drum combination unit builds olls to 60 inches in diameter. The reel and winder shafts are powered each by a constant speed a.c. 20 hp. synchronous motor. The motors are directly connected to No. 3-W Dynamatic couplings of the eddy current brake type. Each shaft is also fitted with a No. 7 GDA Falk reducer with 13.19 to 1 ratio. These are parallel shaft units with output shaft coupled directly to reel spool. A Warner electric brake is mounted on the end of the input shafts, opposite the Dynamatic couplings. See *Figure 2*.

The eddy current couplings serve a dual purpose—first, as driving couplings to provide speed variation and accurate sheet tension when used for reeling; second, as a hold-back brake to control sheet tension when reel drum rotation is reversed for winding.

### Reeling Operation

Separate tachometers mounted side-by-side on the reel control panel indicate the paper speed leaving the calender and the rotational speed of the reel drum. These separate tachometers are then matched manually by adjusting a small rheostat on the same control panel.

The operator now starts the sheet around the rotating drum. On this same push-button panel there are two more rheostats. One controls the tension to be exerted on the sheet when the roll is first started. The other adjusts the rate of increase in torque as the diameter of the roll increases. Once set for a given grade of board, the controls need no further adjustment to assure constant sheet tension.

When the roll has built up to the required maximum diameter, the operator starts the other reel spool and brings it up to the desired speed through rheostat synchronization in the same way as before.

### Winding Operation

The operator's next step is to thread the paper from the loaded reel through the Camachine winder and start that roll. As the roll on the winder starts up, the winder drive inches at slow speed. When the roll has been successfully started, the speed is increased

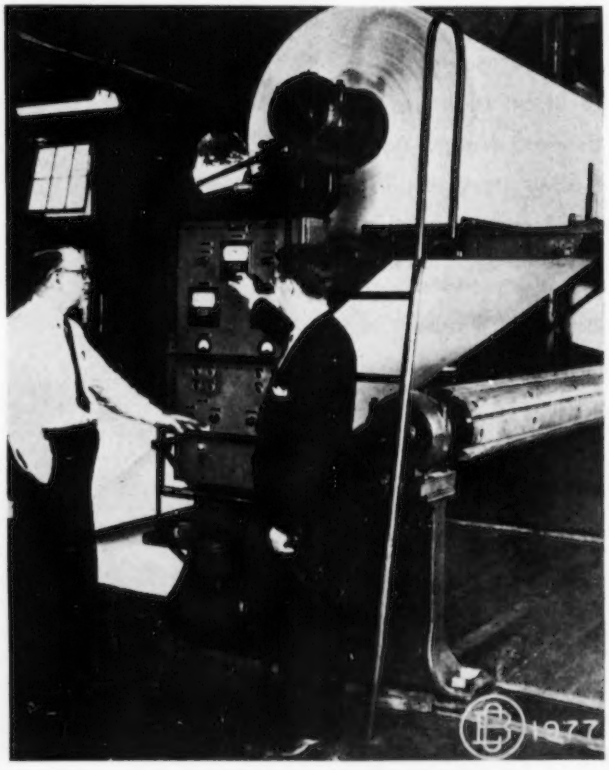

**FIGURE 1—SUPERINTENDENT SAM HODGE** (left) and a B-C engineer discuss the rheostat tension controls of Bloomer Bros. new combination reel-winder.

with another rheostat mounted on the winder control panel.

The sheet tension between the reel and winder is also regulated by two rheostats—one to determine the basic hold-back torque and the other to determine the rate of torque change as the roll changes in diameter.

### Estimate of Performance

Bloomer Bros. reports that the combination unit maintains the desired sheet tension in both reeling and winding with simple and rapid adjustment of the rheostats.

With former equipment, the mill experienced a undesireable percentage of soft rolls. The new reel-winder has eliminated this problem and builds rolls of homogeneous hardness.

Maintenance on the drive equipment is extremely low because there is no mechanical contact between the driving and driven members. The Dynamatic eddy current couplings are water-cooled and are designed to stop the drive through the Warner electric brake in the event that the cooling system fails. Mr. Hodge reports that such failure has never occurred, but that he once ordered the water turned off deliberately to test the safety system, and found that it functioned perfecly.

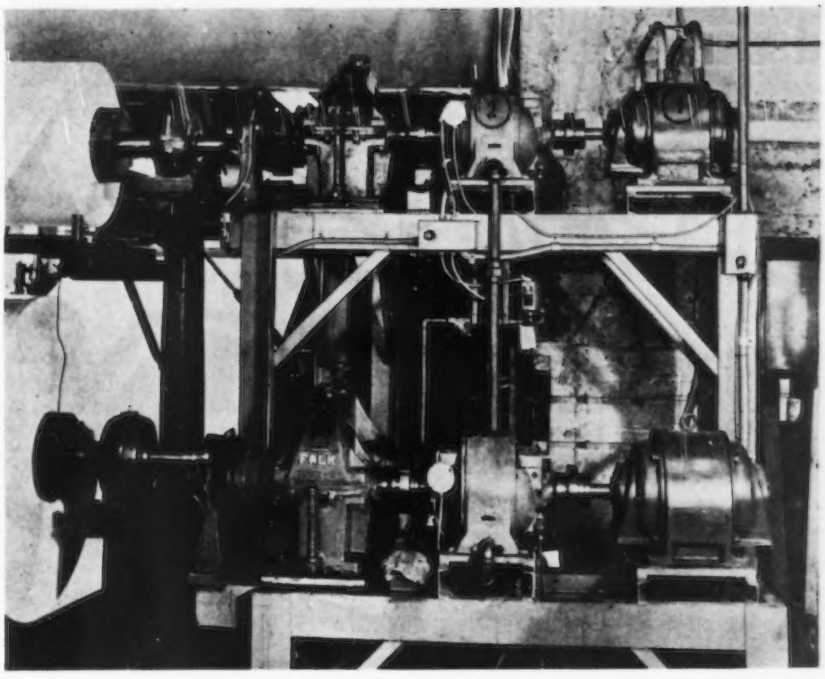

**FIGURE 2—TOP AND BOTTOM SPOOLS OF THE COMBINATION UNIT** are driven by identical equipment: 1) 20 hp. constant-speed a.c. motor; 2) Dynamatic eddy current coupling; 3) Falk reducer; 4) Warner electric brake.

# Two Mills Report on Reslin Suction Box Covers

**Early trials at Thilmany Pulp & Paper Co. and at Marathon Corp. have furnished interesting data on this new type cover.**

Suction box covers of fabricated design that employs resin and textile threads, were recently introduced by Appleton Wood Products Co. These composition Reslin covers can be made up with varying properties to meet specific application requirements.

As shown in the accompanying figure, the thread ends used in the manufacture are exposed on the box surface. This construction is said to promote uniform wear of the surface. It is further declared that these covers will not absorb moisture, thus eliminating contraction and expansion and the need for wet storage while the machine is down. Greater open areas are obtainable for faster water removal, it is said.

The following two statements, supplied to *Paper Trade* JOURNAL by the manufacturer, give some idea of the wearing quality and drainage characteristics of these boxes:

A. M. Schmalz, production manager, and F. K. Kreiling, paper mill superintendent, Thilmany Pulp & Paper Co., Kaukauna, Wis., reports as follows:

"Our first Reslin suction box cover was installed on our No. 9 Machine on September 19, 1952. This cover has been in continuous service since that time with only one regrinding required.

"Original thickness of the cover was 1½ inches; present thickness is 1⅜ inches, indicating a decrease of only 1/8 inch of cover thickness as a result of the original grinding, one resurfacing and seventeen months of actual operation."

In another report, John E. Spalding, superintendent and process engineer, Oswego Div., Marathon Corp., Oswego, N. Y., states:

"Two of the three wet boxes ahead of the dandy roll are covered with these covers in the Reslin "Lo-Vac" design. They were placed on the machine last September and we have not yet found it necessary to resurface them.

**MAGNIFIED VIEW OF COVER** detail shows exposed thread ends on surface of the box.

"Our fourdrinier is principally employed in the manufacture of food board of 195 lbs. (24 x 36—500) basis weight and heavier. After installing these suction box covers we were able to use more water on the wire with attendant improvement in formation and bursting strength. On lighter weight sheets the additional water removal capacity was advantagelously utilized either by increasing the machine speed or by increasing the degree of refining depending upon quality characteristics desired in the finished sheet.

"Our experience to date with these covers has been wholly satisfactory and beneficial."

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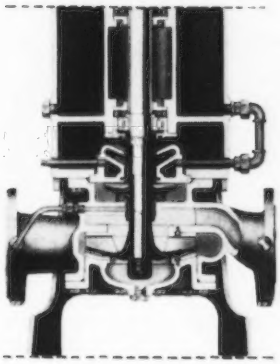
## *The Centrifugal Pump*

## *entirely without Stuffing boxes*

*Especially for black liquor injection in recovery units.*

A vital operating problem for the chemical industries has now self-evidently been solved. The Nobox centrifugal pumps have created a shaft seal of such revolutionizing type that liquids of all kinds can be carried without risk for delays in operation on account of leaks and re-packings frequently recurring. The pump is not restricted from other possibilities of application due to its design. The Nobox pump will operate with equal reliability at positive pressure and vacuum within very great temperature and pressure limits.



### *This is the seal*

The liquid lock wheel is the major part of the design and the sealing action, located at the suction side, occurs entirely hydrodynamically. The upper vane ring of the wheel creates a liquid ring on rotation, which will seal against positive pressure and infiltration. The lower side of the vanes prevents air from coming in, when the same pump is operating at vacuum or suction height. By proper balancing of the ratio between the diameters of the upper and lower vane ring, power consumption is reduced to a minimum. When the pump is out of operation, sealing is accomplished by a disc valve, which, however, during operation is completely disconnected and consequently is not subjected to any wear.

### *This is the performance*

Nobox is the only pump entirely without packing boxes that has the sealing located at the suction side. That is why the upper limit of its efficiency can be set so high. With respect to capacity and pressure height the Nobox is designed in three major series. Z30 radially divided one-wheel pumps. Z32 axially divided one-wheel pumps provided with pump wheel of two-side suction. Z33 axially divided two-wheel pumps with pump wheels operating in series.

The table shows the application of the various types. The parts coming into contact with the liquid pumped are made from a number of various materials including cast iron, stainless or acid-proof steel and hard lead and hard rubber. The Nobox is very strongly designed. The vertical assembly of the pump makes it easy to install, saving a lot of floor space and providing effective protection for bearings and motor.

**Nobox** *pumps have a self-evident application in*

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**SULPHITE MILLS**
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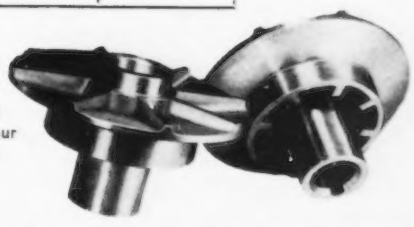
| SERIES | MAX. CAPACITY U.S. GPM | MAX. HEAD feet | PRESSURE ON SUCTION FLANGE | |
|---|---|---|---|---|
| | | | MAX. POSITIVE PRESSURE p.s.i.g | MAX. VACUUM Inches Hg |
| Z30 | 560 | 250 | 50 | 24 |
| Z32 | 2600 | 185 | 39 | 24 |
| Z33 | 130 | 500 | 55 | 24 |

To the employees engaged in the chemical industry, the qualities of the Nobox centrifugal pumps will mean an entirely new basic point from which to plan the operation. We should be glad to mail detailed information and also would appreciate it if a personal call by our representative could be arranged. Just write: "Nobox", The Swedish Chamber of Commerce of the U.S.A., 45 Rockefeller Plaza, New York 20, N. Y.



**JÖNKÖPINGS MEKANISKA WERKSTADS AKTIEBOLAG**

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# Softer Tissue Sheet Results From New Stockmaster Refining at Bancroft

**As told at the Mill to Editors of *Paper Trade* JOURNAL**

For several reasons, Robert H. Raines, general superindendent at Bancroft Paper Mills Corp., Bancroft, Mass., is pleased with the performance of the Jones Stockmaster which was installed in his mill a few months ago.

The Stockmaster is a new conical refiner being produced by E. D. Jones & Sons Co. and offered for continuous beating of stock.

The Stockmaster at Bancroft is fitted with a Type P B 21-inch plug designed for brushing action without cutting. The filling is furnished with 3/8-inch bars of stainless steel. This refiner is driven by a synchronous 75 hp. motor, which is adequate power for handling 9½ tons of stock per day. The machine is basically designed for capacities requiring up to 150 hp. The refiner, weighing 3900 pounds, is compactly constructed, a fact that was advantageous to this installation, since the refiner and the motor had to be placed in a confined area with low headroom above the machine room floor. See cut.

## Unique Location

The Stockmaster prepares stock for the No. 2 paper machine which is located at the opposite end of a long narrow machine room. It is a truly amazing arrangement. Refined stock from a head box above the refiner flows through a pipe down to the machine room, level, past No. 1 paper machine and the dry end of No. 2 machine to the inlet pump on the wet end of No. 2.

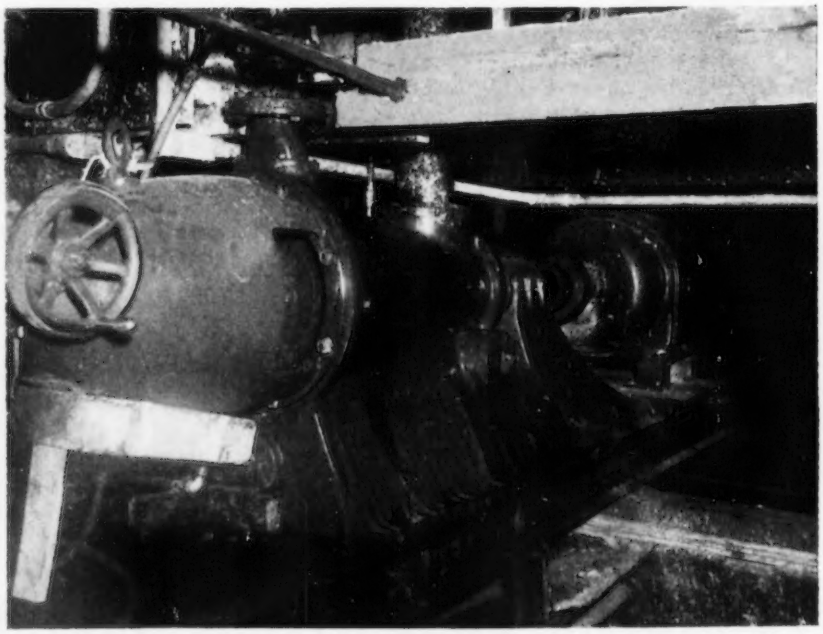
## Softer Sheet

No. 2 paper machine makes facial tissue, roll tissue stock, and napkin grades. The major contribution of the Stockmaster to this production is the brushing of the stock to produce a softer sheet than formerly. This single refiner replaced two Midget jordans, each with a 14-inch plug. These units, according to Raines, exerted a cutting action on the fibers that resulted in a harder sheet formation than was desired in these tissue grades.

The action of the Stockmaster at Bancroft is controlled by a standard 10-inch hand wheel with worm and worm reduction gear. The unit can be fitted, if desired, with a gear motor and parts to change over to remote or fully automatic control. Also, the plug filling can be changed to provide more cutting action if desired.

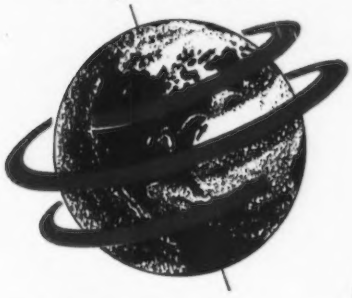
## Lower Power Cost

The Stockmaster at Bancroft is effecting a saving in power costs. The two former Midget jordans drew an average of 68 amperes, 38 on one and 30 on the other. The Stockmaster, handling the same amount of stock, draws an average of only 45 amperes.



**THE JONES STOCKMASTER** at Bancroft Paper Mills Corp. is mounted in a confined area above the machine room. It refines 9½ tons per day at 75 hp.

*Over 750 Installations in 22 Countries Throughout the World*



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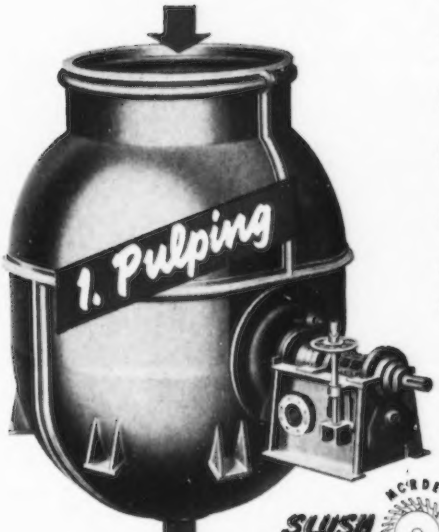
**EACH MILL'S** requirements suggest various applications.

**OUR EXPERIENCE** in assisting mills to develop simple, effective and economical stock preparation systems is available to you upon request.

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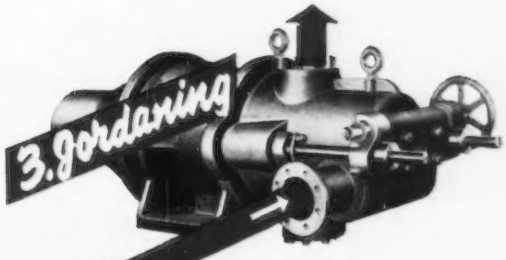
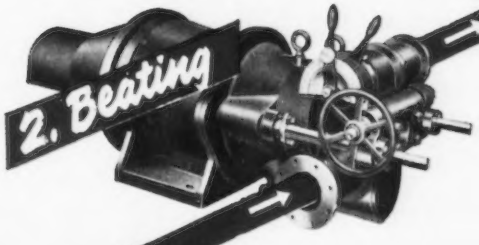



MORDEN STUFF MAKER

... for cutting or shortening where required to obtain specific sheet properties.

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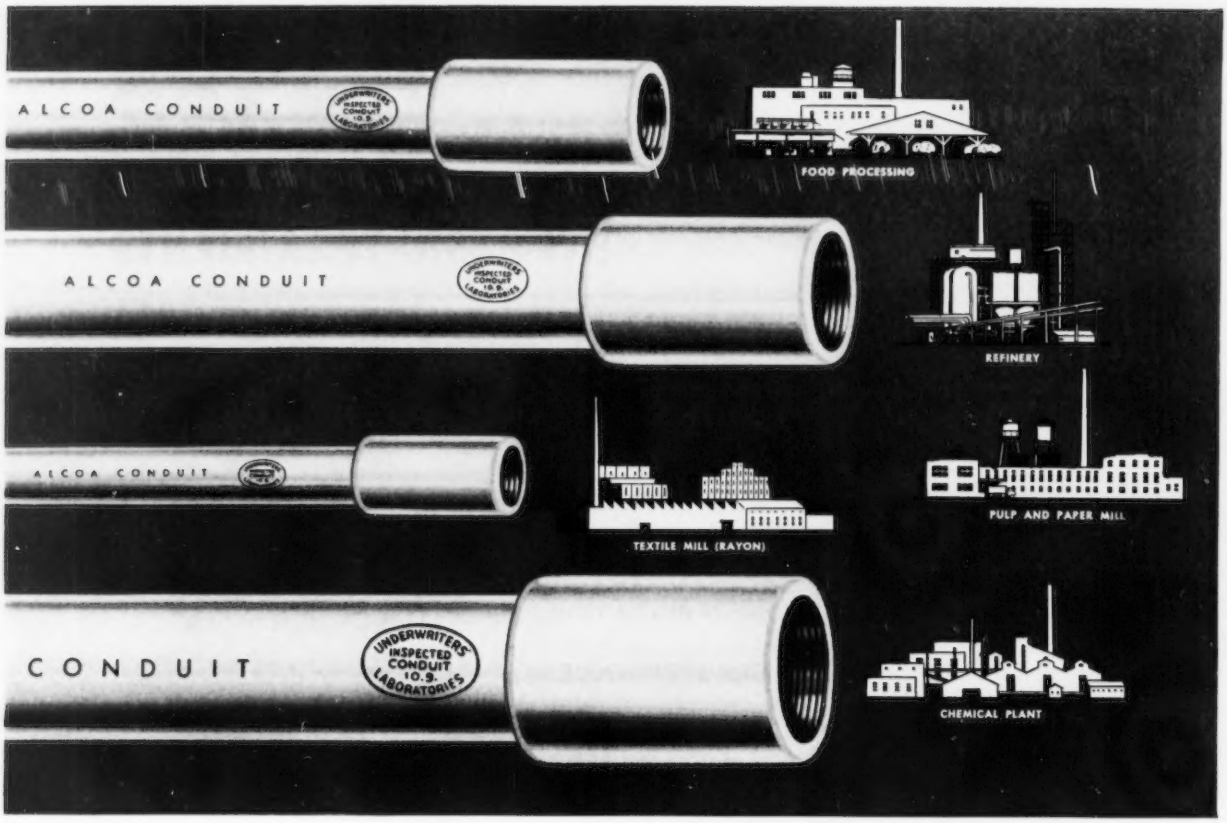


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In addition, Alcoa Aluminum Rigid Conduit is nonmagnetic, lowers voltage drop, eliminates overcrowding of terminal enclosures and simplifies the installation of electrical equipment having widely spaced terminals.

Alcoa Aluminum Rigid Conduit reduces handling, fabricating and installation costs. It is only about one-third the weight of the same size in steel. A 10′ length of the 4″ size weighs only 33 pounds and can easily be handled by one man.

Alcoa Aluminum Rigid Conduit is approved by Underwriters' Laboratories, Inc. and each piece bears their label. It is readily available. Call your local Alcoa sales office, listed under "Aluminum" in your classified directory. ALUMINUM COMPANY OF AMERICA, 2106-E Alcoa Building, Pittsburgh 19, Pa.

For complete information write for Alcoa's new booklet, *Alcoa Aluminum Electrical Rigid Conduit.*

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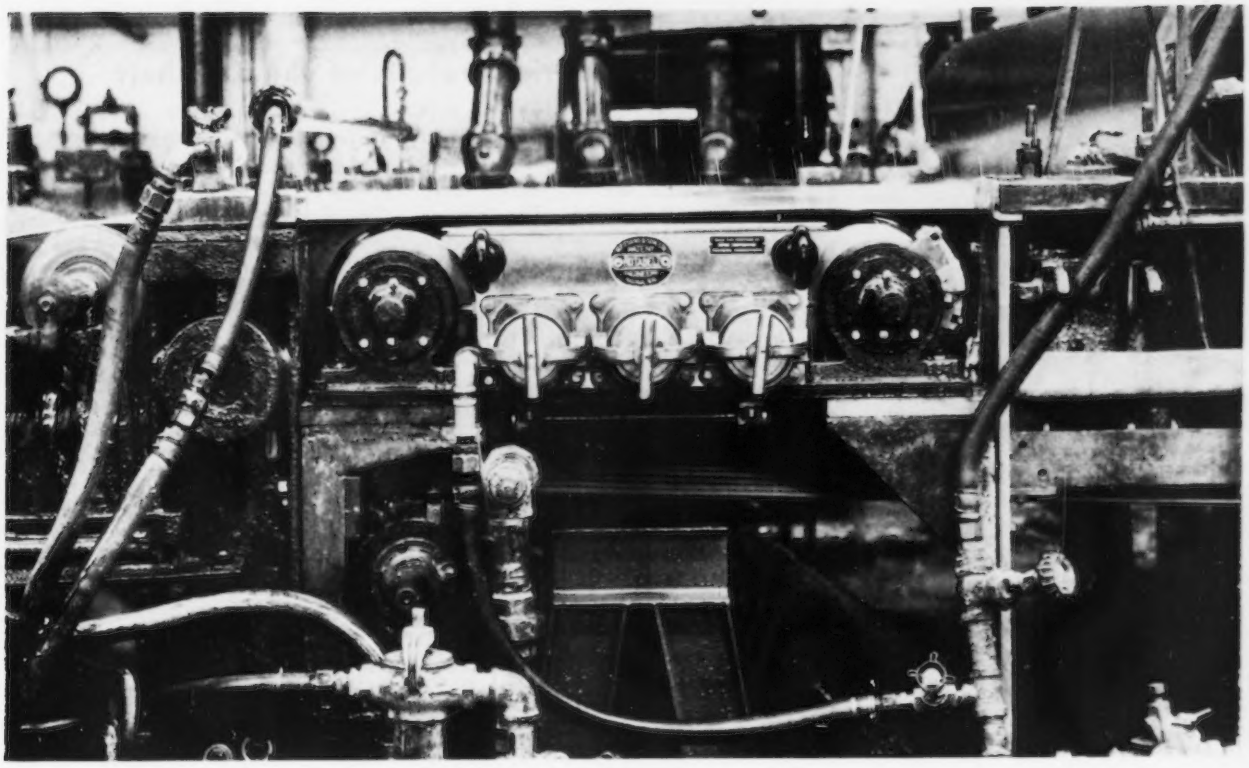

The Rotabelt installation on Fitchburg's No. 5 Paper Machine.

# What Rotabelts Are Doing At Fitchburg Paper Co.

**This first-hand report of rotary suction units was obtained by the editors of Paper Trade JOURNAL at the U. S. mill that has operated them the longest under fourdrinier wires.**

Although the Rotabelt, an English rotary suction device, is not a brand new piece of paper machine equipment, it has become available to mills in the United States only within the last year and a half. The device was developed to replace stationary vacuum boxes on paper machines with the principal advantage of reducing frictional wear of fourdrinier wires and felts.

Even before W. P. Evans & Sons, Ltd., established a plant in Nashua, N. H. to produce Rotabelts for the U. S. market, Fitchburg Paper Co. installed an English-made unit on one of the fourdriniers in its five-machine fine paper and specialties mill in Fitchburg, Mass. Subsequently, additional units were installed at this mill, so that Fitchburg now has four of them running. All four have replaced stationary boxes under fourdrinier wires, so that this report from Assistant Mill Manager Gilbert F. Parks is limited to the unit's performance in the fourdrinier frame and not with felts. (A Rotabelt was recently installed on a felt in another Massachusetts mill, but this job is too new to furnish a conclusive case history.)

## The Fitchburg Installations

The four rotary units at Fitchburg are listed below in chronological order:

**1.** No. 6 Machine, specialty papers, 113-inch wire, 200 to 500 feet per minute, grade weights from 30-pound to 178-pound.

**2.** No. 1 Machine, specialty papers, 91-inch wire, 300 to 450 feet per minute.

**3.** No. 7 Machine, mostly offset, 160-inch wire, up to 650 feet per minute.

**4.** No. 5 Machine, specialty papers, 91-inch wire, 100 to 450 feet per minute.

The first unit has been running 18 months, the second about a year; the third about six months, and the fourth was just recently installed. Each replaced three stationary boxes on its machine. Each is a standard three-compartment unit, tailored to the installation only in respect to deckle width across the machine.

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*for the manufacture of Cellophane, Rayon and Products of Paper*

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BLEACHED SULPHITE PULP

RESTIGOUCHE COMPANY, LTD.

Campbellton, N. B., Canada

## Construction Details of the Rotabelt

The Rotabelt consists of a central casting usually of three separate suction compartments. On either side of the casting are rolls which carry an endless rubber belt. The belt has multiple, overlapping grooves with a hole at the bottom of each. These holes run over grooves in the suction compartments, and through this combination suction is created beneath a wire or felt.

On machines making various sheet widths, a graduated deckle arrangement is fitted at both ends of the unit to suit individual requirements. The rubber belt is lubricated on its inside face with a fresh water shower.

As the wire or felt is pulled onto the belt by suction, it provides the power to drive the unit. For special applications, the unit can be furnished in one or two compartment construction. Current operating limitation is maximum speed of 1000 feet per minute. The manufacturer states, however, that design changes are under way to advance the maximum limit.

Besides savings in clothing life, the manufacturer reports power savings such as that on a 164-inch machine with sectional drive, which is said to have produced an average power reduction of 45 per cent, based on comparative readings of couch power.

### Much Longer Wire Life

Lengthening of wire life is the most obvious accomplishment of the Rotabelts at Fitchburg, although other collateral improvements have been recognized.

All four units operate under wires of phosphor bronze, 75/58 mesh, twill weave. According to the mill's records, since the units were installed, the average wire life has tripled on No. 6 machine, has more than doubled on No. 1 machine, and has nearly doubled on No. 7 machine. The records on No. 5 machine are too recent to furnish an average.

### Other Advantages

**1.** Fitchburg also reports that the rotary units have eliminated all freezing or stalling of the wires regardless of the amount vacuum applied.

**2.** Because maximum suction is operating continually, Fitchburg has noted that the sheet usually runs drier to the suction couch than before.

**3.** Removal of the Rotabelts from the fourdrinier frame is as simple or simpler in some cases than the former stationary boxes. Because the construction of three of the fourdriniers allows space for channel irons across the machine, the rotary units in these machines have been fitted with eye bolts and rollers which permit the units to be rolled out of the frame.

### Additional Considerations

Although it is possible to observe traces of the Rotabelt's belt pattern in the wet sheet as it approaches the end of the fourdrinier, these shadow marks can not be observed in the dried sheet. They are completely dried out by the vacuum on the couch and the action of the presses.

Fitchburg runs dandy rolls on its machines to apply watermarks as well as finish to the sheet. A single flat box is retained after the dandy on all machines. The Rotabelts following the dandy rolls and this suctionbox, do not effect the water mark.

One-sideness of the sheets does not appear to be increased by the Rotabelt, neither is it lessened.

It has been estimated that the increased dryness of the sheet to the couch is effecting some saving in dryer steam but no measurement of this saving is attainable. The same situation is true of any reduction to the power at the couch drive owing to decreased frictional drag on the wire.

It is conceivable that the increase in water extraction at the fourdrinier effected by the Rotabelt would permit the Fitchburg machines to be speeded up. This has not been done because other factors of sheet formation, etc. are involved.

The savings in wire cost are computable, however, and Fitchburg estimates that these savings will absorb the cost of a Rotabelt unit in less than a year.

## More Accurate Crane Control

### A Manufacturer's Report

Selectodyne is the trade name of a new control to give increased precision and smoothness in handling loads with Whiting Cranes. The control is produced by Whiting Corp., Harvey, Ill.

The unit is available for all capacities of overhead cranes. It offers eleven speeds in either direction. It is equipped with an automatic load brake.

It operates from a single control lever. The operator moves the lever forward to lower the hook, backward to raise it, and from left to right to change the hook speed.

EVANS' Patented
ROTABELT
SUCTION Unit
Saves wires and felts—increases output. The success and popularity of the ROTABELT is proved by the prodigious demand, urgent repeat orders and the scramble for delivery. Why...? because the results are so sensational!
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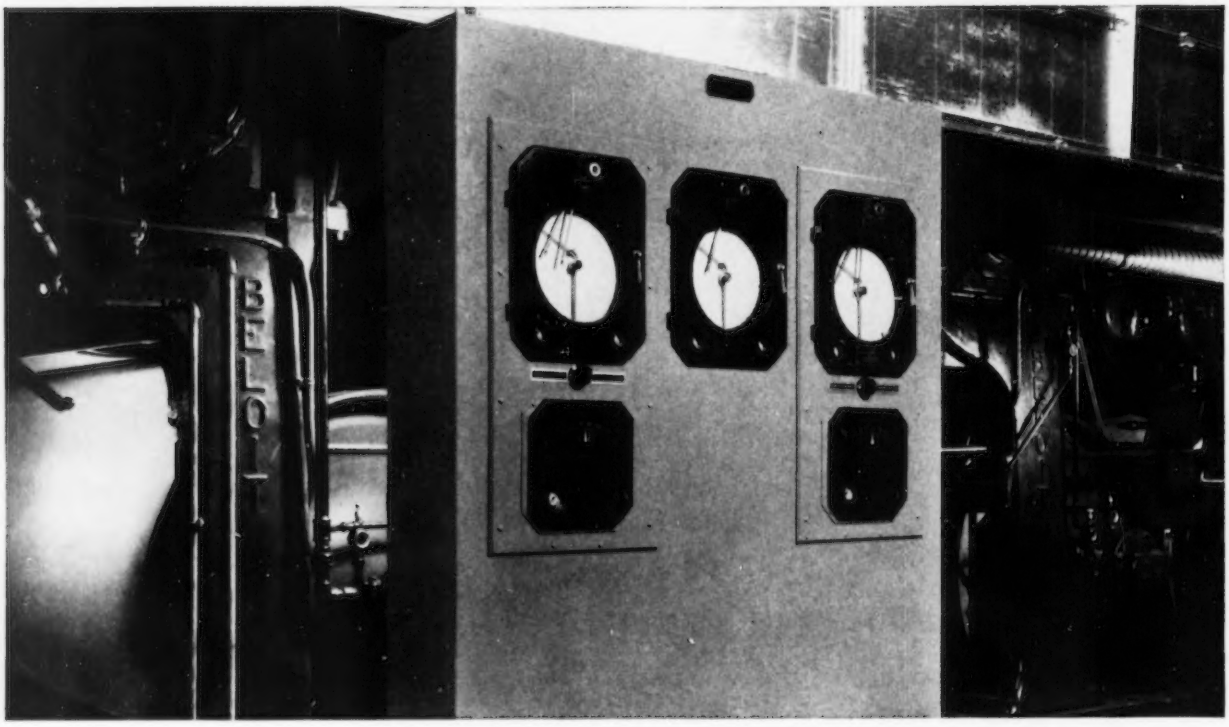
# Over 300 of these Stamm Moisture Control Systems are giving "Guaranteed Satisfaction"



And Stamm Drying Controls Inc., of Lockport, N. Y., rely on "proven automatic controllers by Taylor" (as they put it) for the successful operation of their system. This simple and practical method of controlling the moisture content of paper is now being used with great success on Board, Kraft, News, Toweling, Tissue, Magazine Book, Bond, Carbonizing, Greaseproof, Glassine and Parchment at speeds from 100 feet to 1700 feet per minute. The unit can be quickly adjusted to handle a wide variety of grades on machines making specialties, and satisfactory operation is obtained on heavy boards running as low as 3% moisture, as well as on very light weight tissues.

With the Stamm Control System: moisture content can be run higher, resulting in greater profit and improved quality of the sheet. Breaks and snapoffs in the dryers are greatly reduced. A more uniform finish is assured. The backtender doesn't have to give constant attention to drying. And constant moisture means constant physical properties. Picture above shows the main control panel for 2 Stamm control systems in use at a well known Southeastern Paper Mill, making a quality kraft sheet. The Taylor Fulscope* Recording Ratio Controllers (*at top*) control the main steam supply to the dryers, and provide a continuous record of steam pressure, moisture variations, breaks and down time. The Indicating Controllers (*below*) are Constant Pressure Regulators, used as manual controls during periods when the sheet is off the machine. The fifth instrument (*center*) controls the wet end section.

This is another example of how Taylor is working successfully with the manufacturers of equipment for the paper industry. Why not call your Taylor Field Engineer —or write Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

*Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.*

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**MEAN**
**ACCURACY FIRST**
**IN HOME AND INDUSTRY**

# Strain Gauge Measurement of Press Loads and Felt Tension at Gibraltar

## As told at the Mill to Editors of Paper Trade JOURNAL

All of the air-loaded presses on the 152-inch seven cylinder board machine at Gibraltar Corrugated Paper Co., North Bergen, N. J. are equipped with Downingtown Load Meters. This mill has also installed Downingtown Tension Meters on the top wet felt of this machine. Both of these meters employ as their basic element a bonded wire strain gauge which measures the nip pressure of the presses and the tension on the felt without itself influencing the measurement. Production chiefs at Gibraltar report that these measurements, when recorded continuously on 24-hour charts, produce information that increases the efficiency of machine operation in several ways.

### Functioning of the Meters

The fundamental idea on which the Load Meter and the Tension Meter are based is the strain resistance relationship of metal wires. The units are made up of a short length of strain sensitive wire bonded to a steel column. The column is interposed directly into the load carrying member of the press roll or felt carrying roll. Changes in the load on the column cause a corresponding elongation change in the wire, thereby effecting changes in the resistance of the wire to an electric current, which are in turn recorded by instruments calibrated to read in pounds.

Because the gauges are located to record loads directly, they by-pass the devices of pressure and tension control that are often productive of inaccuracies, such as pin friction, knife edge friction, eccentric or misaligned loads, piston packing and gland friction, piston leakage.

A gauge is located at each end of a given press roll or felt roll, and each transmits its own record of true pressure or tension within an accuracy of one per cent. Thus, an operator can see at a glance where unequal loading is occurring and can take steps to correct it, whether it be a matter of inaccurate crowning, slice adjustment, uneven drainage of stock, etc.

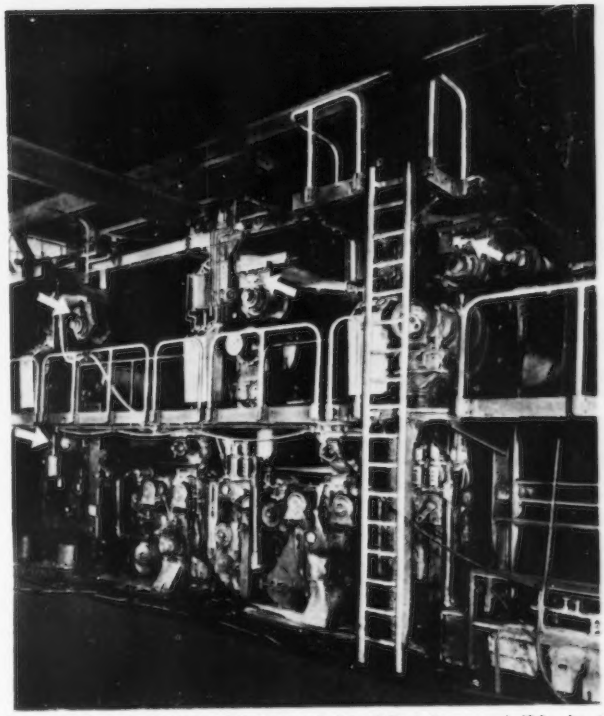


**FIGURE 1—FOUR DOWNINGTOWN LOAD CELLS** are visible in this view of the 153-inch cylinder machine at Gibraltar Corrugated Paper Co. (See arrows.) The three upper deck cells are mounted between top arm and bearing housings of the three top press rolls. Lower cell is connected to air cylinder rod of the suction extractor.

### Press Meters At Gibraltar

Downingtown Press Load Meters, employing 26 strain gauges are installed at 14 points on the cylinder machine at Gibraltar Corrugated Paper Co. Typical installations are the four shown in Figure 1.

The over-all installation includes two indicating-recording instruments mounted in the mill's central instrument panel. These provide visual indication of loads at the 14 points as well as an inked chart record for each point.

### Permanent Record Valuable

E. F. Manogue, vice-president and general manager of Gibraltar, and John Verwayen, chief engineer, stat: that one of the prime virtues of the load meters is the permanent record they provide. Not only do the calibrated readings permit accurate adjustments to obtain even nip pressures, but the record of these readings become valuable references to the most effective nip pressures for vari-

ous board weights and reliable checks for the guidance of machine operators.

The elimination of uneven pressure across the rolls also permits the felts to run smoother, lengthening their life and fostering more uniform drying of the sheet across its width.

### Felt Tension Meter

By attaching a strain gauge to each end of a felt idler roll in the manner shown in *Figure 2*, people at Gibraltar are obtaining valuable load data on tensions of the top felts, in the same way the nip pressures are obtained.

Here again, Gibraltar cites the value of a permanent record of felt tensions. Operators can now consult the records of past runs and be guided in setting the felt tension for repeat runs of similar sheets. Because the meters indicate the maximum effective tension, the felts can be run without unnecessary strain thereby giving maximum running life.

The Felt Tension Meter can also be connected with a motor on the jack roll, which is wired to start up and make tension adjustments automatically when deviations occur in the established tension. However, this automatic control is not in operation on the Gibraltar machine.

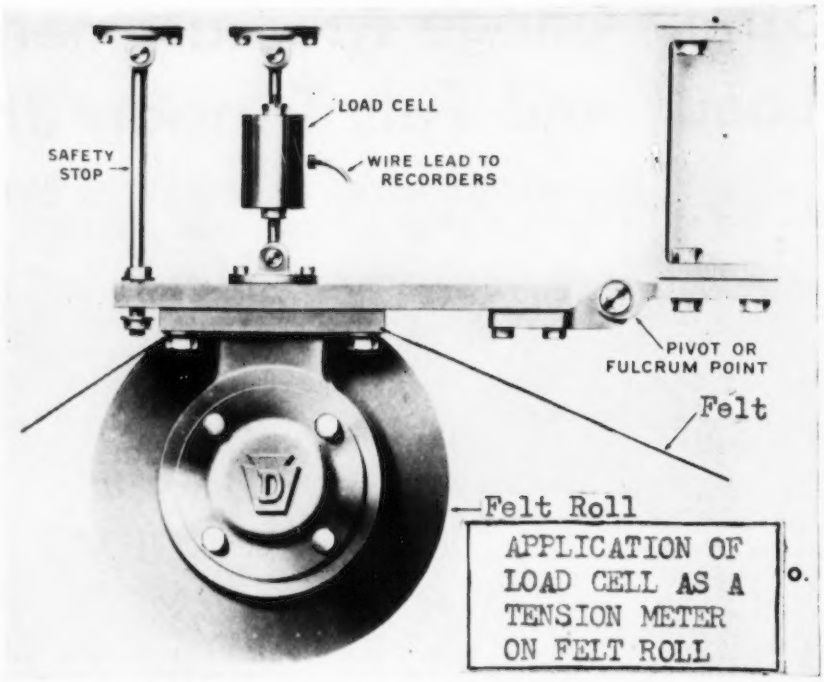
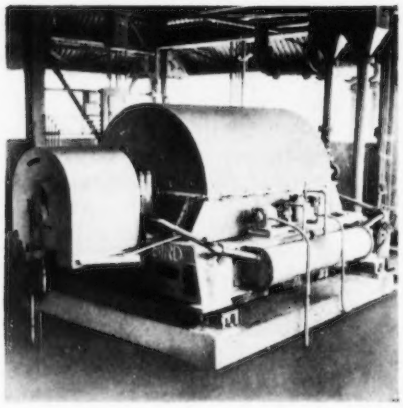



**FIGURE 2—A REPRESENTATION OF HOW THE LOAD CELL CAN BE MOUNTED** to record felt tension. Similar installation can be made on fourdrinier wires.

# Riegel Carolina Reports On the Bird Lime Mud Filter

**J. D. Dailey**
Production Manager, Riegel Carolina Corp.



**INSTALLATION VIEW** of the 40-inch x 60-inch Bird Continuous Centrifugal Filter at Riegel Carolina Corp.

Riegel Carolina Corp., Acme, N. C., has one 40-inch x 60-inch Bird Centrifugal Filter that has been in continuous operation since December, 1951. It has performed very satisfactorily from the date of installation to the present time.

### Filtering System

The filter system is arranged as follows: Lime mud at approximately 30 percent solids from the mud storage tank is pumped to a Traylor Slurry Feeder. The slurry feeder meters the amount of mud being processed and discharges it into a flow splitter which feeds the filter under normal loads, but diverts the feed slurry back to the mud storage tank when the Bird filter is overloaded. The Bird filter is fed through the feed pipe which is mounted on the base and extends through the conveyor trunnion and into the feed compartment located in the conveyor hub. Wash water is added and both filtrate and solids are collected on the shell and discharged into hoppers. The filtrate is discharged from the filtrate hopper to the gas scrubber tank for use in recovery of kiln gases. The filter cake containing approximately 61 percent solids is discharged into a screw conveyor which in turn discharges to the kiln feed end. The lime thus burned is returned to the causticizing system for re-use in the slaker.

### Construction

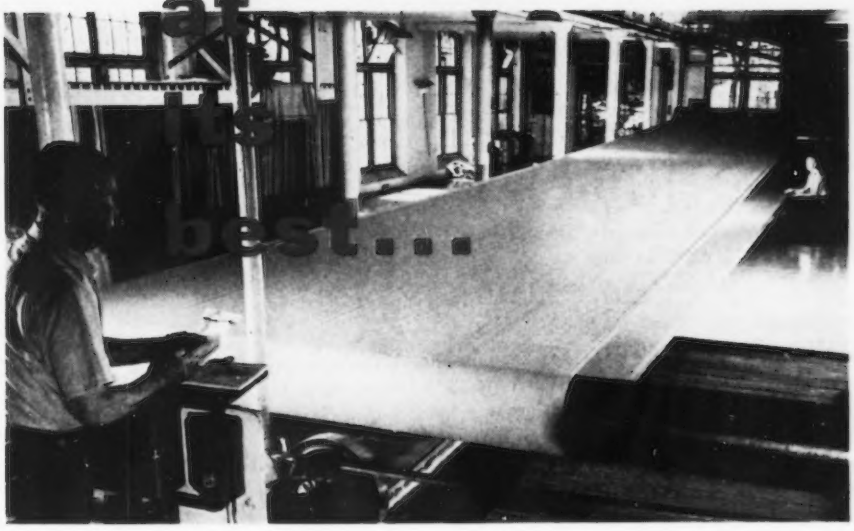
The Bird Continuous Centrifugal Filter as specified for Riegel Carolina use, is the solid bowl type. The construction is steel throughout, but it has conveyor flights, slurry feed ports, and solids discharge plows coated with hard surfacing. The main bearings are lubricated with a pressure oil circulating system. The machine is belt driven by a 75 hp., 1170 r.p.m. totally enclosed fan cooled motor.

### Low Maintenance

As stated above, this equipment has performed very satisfactorily with a minimum of lost time. We have in the past two years during planned shutdowns opened the machine up for a thorough inspection and found that all mechanical parts were in very good condition.

# Teamwork...

Custom-design



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The Huyck custom design operation is sparked by a Huyck field serviceman. Experienced and capable, he works with you on your felt requirements, then transmits this exact information to the Huyck designers.

Nine designers analyze all the requisites for each felt Huyck makes for you. Every element of its construction is tailored exactly to the specifications which will suit your machine precisely — to provide maximum efficiency at lowest cost per ton.

*Consider service carefully when you buy felts: it must always be complete and dependable. As the Huyck service record proves, Huyck felts — with Huyck service — mean better production and lower costs for you.*

# How W. C. Hamilton & Sons Uses the Foxboro Beta-Ray Sheet Weight Profiler

**Philip A. Cerasoli**

Director of Quality Control, W. C. Hamilton and Sons, Miquon, Pa.

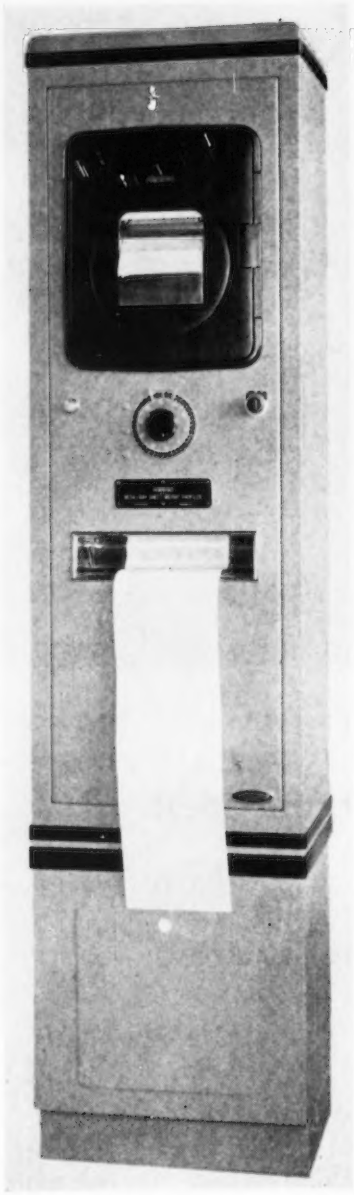
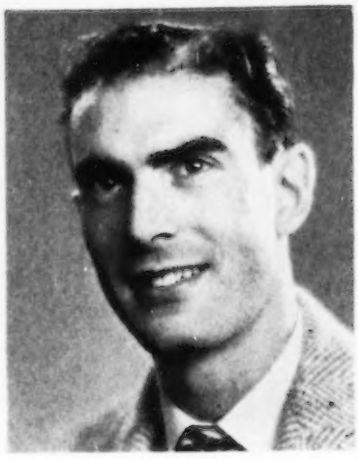


FIGURE 1 — Material to be profiled is fed into the slot of the Foxboro Beta-Ray Sheet Weight Profiler. Instrument shown above is the type used at W. C. Hamilton mill.

Though weight has always been an important factor to the papermaker, its significance is becoming even more pronounced as further advances in technical knowledge demand that greater attention be focused on the function of weight in both the manufacture and use of paper. Volumes have been written on the problems of achieving, maintaining, and controlling weight in the papermaking industry. The space allotted to this article precludes any lengthy contribution to the material already available. Instead this report will present only in general terms a method of weight control in which the Foxboro Beta-Ray Sheet Weight Profiler is utilized.



## Fundamental Concept

As a beginning, it might be best to discuss briefly the fundamental concepts upon which an instrument like the Profiler would be developed.

The degree of radioactivity of a substance can be measured quantitatively with the aid of an ionization chamber. Upon the application of a proper voltage, the ionization created in the chamber by the radiation emanating from a radioactive source can be converted into current. The amount of current produced is a measure of the number of ions in the chamber, which, in turn, are a reflection of the strength of radiation entering the chamber. If a material was to be interposed between the radioactive source and the detecting ionization chamber, the amount of radiation entering the chamber would be dependent upon the ability of the material to allow passage of radiation. As the degree of ionization in the chamber varies according to the amount of radiation passed by the material, so would the amount of producible current. The current produced could be expressed in terms of the weight or thickness of the material placed between the radioactive source and the detector. Basically, then, for an instrument to be able to measure the weight or thickness of a material by means of radioactivity, it would require a source of radiation, a method of detecting radiation, and a recording device. In essence, the Profiler is such an instrument.

## Operation at W. C. Hamilton

The operation of the Profiler is not complicated. At W. C. Hamilton and Sons, Miquon, Pa., the Profiler is being used to control weight across the machine and is operated by personnel who have received, and needed, little in the way of special training or instructions. Control personnel have found the procedure quite simple.

The sampling is done at the machine by taking, across the reel, a strip approximately 6 inches wide. The strip is taken to the Profiler (See *Figure 1*) and played into the receiving slot, beginning usually with the front side, until contact is made with a feeding wheel. This contact signifies that that portion of the strip immediately behind the feeding wheel is now positioned between the radioactive source and the ionization chamber. Since the paper is now acting as a screen between the source and the detector, the change in current actuates the recording pen allowing it to move toward the center or zero line of the roll chart. After the pen comes to a halt, the operator starts the feeding mechanism which begins to draw the strip slowly into the machine and through the measuring area. As the strip is being drawn into the instrument, the pen records, with a continuous line, the varia-

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The question, usually, is not what to do with white water, but what to do *about* it. Some mills have the problem of stream pollution; others the problem of water supply. Fortunately, Dicalite filtration answers both.

**DISPOSAL** If re-cycling is not required, filtration with Dicalite Filteraids yields a brilliantly clear effluent with no suspended solids to cause pollution.

**RECLAMATION** Filtered white water can be re-cycled, using a partially or entirely closed system. Dicalite filteraids remove all solids to give brilliantly clear water which is equal – often superior – to fresh water for most systems. Only a small percentage of fresh make-up water is needed daily. Water is saved and no disposal system is required.

**IN EITHER CASE,** you get still another advantage; practically 100% recovery of furnish components such as fibers, fillers and filteraid – all of which can be re-used to lower your furnish costs. Let us send you complete information on the many paper mill uses of

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tion in weight of the strip. After the complete strip has journeyed through the Profiler, the feeding mechanism is stopped, and the operator tears off the chart recording. A graphic profile of the weight across the machine has been attained and is now ready to be presented to the proper machine room personnel for appropriate action. All this in the comparatively short time of about 6 minutes. *Figure 2* exhibits the type of recordings obtained for control and record-keeping purposes.

### Calibrating the Unit

The calibration of the Profiler for the measurement and control of different weights is easily accomplished. A sheet known to possess the exact weight which is to be controlled is inserted into the receiving slot of the Profiler in the same manner as described above. If the recording pen upon completion of its movement does not rest exactly on the zero and the standard sheet is withdrawn from line of the chart, the operator adjusts the calibration dial until the pen does come to rest on the zero line. The zero line now represents the aimed-for weight, the instrument. Any fluctuation above and below the zero line is a measure of deviation, plus or minus, from the "true" weight.

### Benefits Production

The procurement of the Foxboro Profiler by W. C. Hamilton and Sons has done much to assist in the improvement of weight measurement and control. The greater accuracy of the Profiler and the impressive graphic presentation it makes possible has given production and control personnel a more confident approach to the problem of weight control. *Figure 2* displays two charts of a before-and-after situation. The bottom chart resulted while weight was out of control. The top chart was obtained after the weight had been brought back under control. Obviously, the charts offer evidence in more emphatic style than one would expect to gain or experience from a group of figures. As a consequence, the education of personnel along weight control lines has been facilitated.

### Improved Roll Hardness

The influence of the Profiler in weight control is also reflected in the improvement of hardness of rolls coming from the rewinders. It hasn't been too long in the past when difficulty was experienced in keeping rolls from being soft in the edges or middle due to variations in weight and/or thickness across the roll. Some rolls were found to be soft in the middle, others soft on one or both edges, while others were soft in the middle and on one edge. The situation proved to be disheartening at times since every effort was being expended to prevent such occurrences. Today, because of the greater sensitivity of measurement possible with the Profiler, softness in rolls is no longer a major problem.

In conclusion, it can be said that the Profiler has been generally helpful in establishing a higher degree of weight control at W. C. Hamilton and Sons. Undoubtedly, the Profiler is not a panacea for all weight control problems, but it has brought out into the light some of the intricacies of weight control which have always tended to remain in an obscure background.

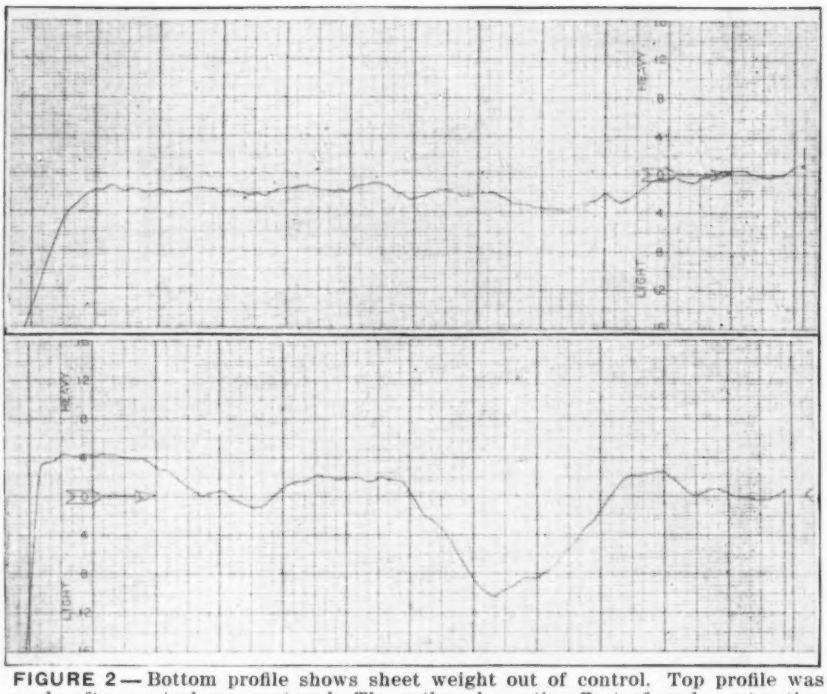
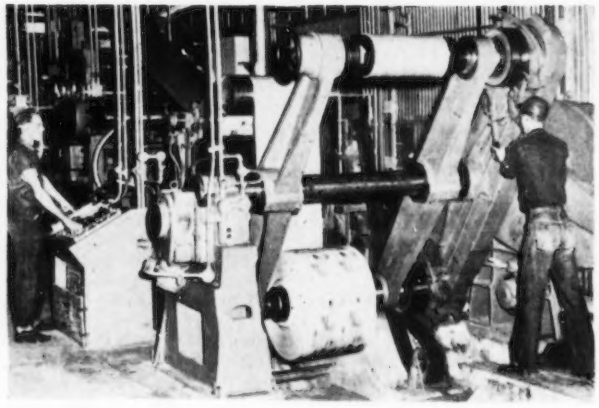
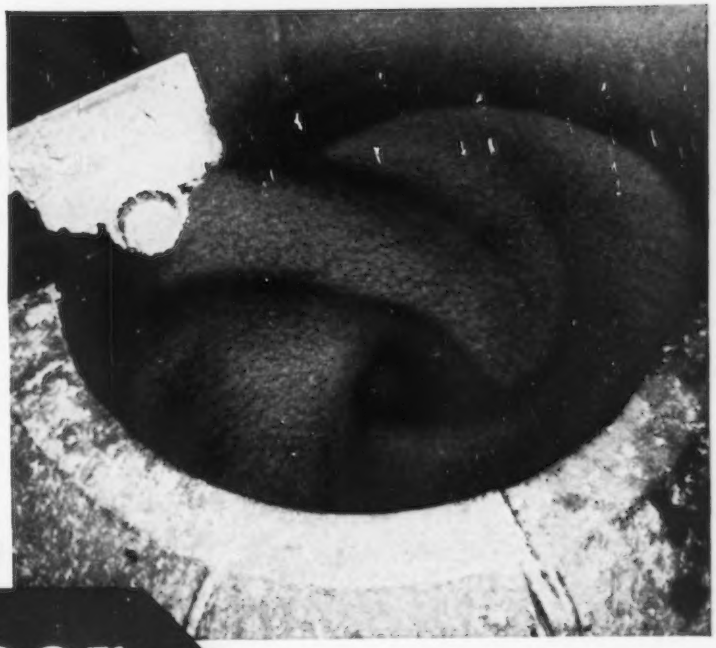



**FIGURE 2**—Bottom profile shows sheet weight out of control. Top profile was made after control was restored. The rather dramatic effect of such contrasting charts tends to awaken operating personnel to the importance of weight control.



**SUCCESSFUL CONTINUOUS WINDING OF PRINTED BOXBOARD** at speeds up to 1000 f.p.m. is being accomplished at Godfrey Box Co., Godfrey, Ill., according to a report from Dilts Machine Works, manufacturer of this Kohler system winder.
The winder utilizes a double envelopment principle at time of roll change. Rolls are wound 78 inches in diameter, 26 inches wide, weighing up to 3000 pounds. No down-time or loss of register occur as web is shifted to fresh core.

**Less Horsepower per ton of pulp production**



***the Downingtown***

# Fibrepulper

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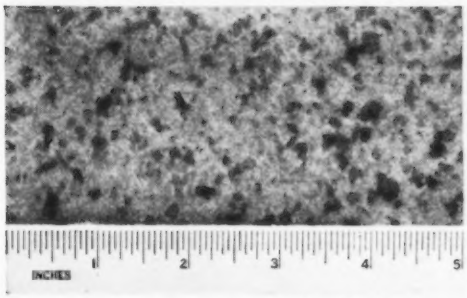
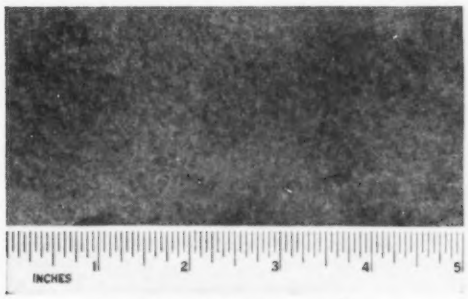



*High wet strength government map paper after 30 minutes pulping in water 200°F. in Downingtown Fibrepulper.*




*Same paper after 90 minutes of pulping.*

Because of its shape and design, the Downingtown Fibrepulper increases the number of times the pulp is passed through the defibring area within a given interval of time. This results in a more thoroughly refined pulp and a consequent appreciable decrease in kilowatt hours required per ton of output. With the high pulping rate the size of the unit is smaller for a given tonnage output. This reduction in size results in space saving and installation cost.

Installations of the Downingtown Fibrepulper are helping mills conserve power, increase production and reduce costs. Our technical men are available to discuss pulping problems with you by appointment.

*Write for Bulletin No. 554 which describes Downingtown Fibrepulpers in detail.*

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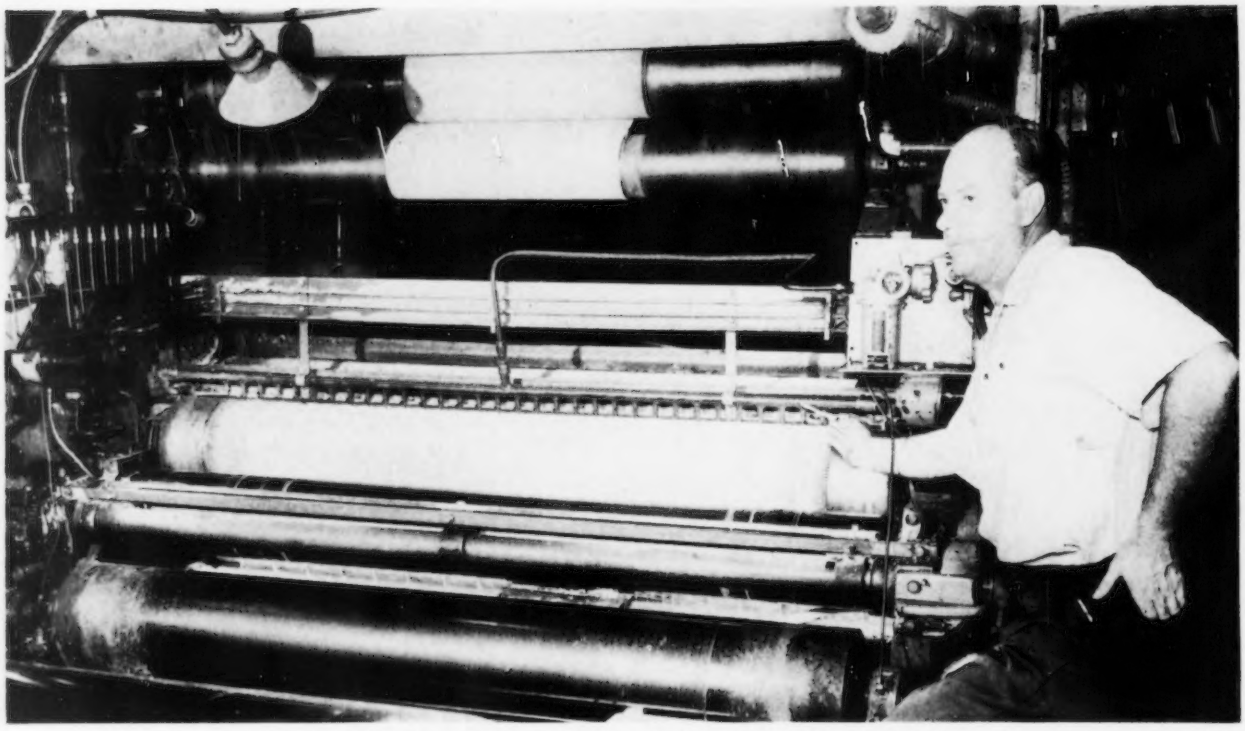


**MAINTENANCE FOREMAN CHARLES DRESSELER** points to pipe that supplies straw oil lubrication to the 32 Alemite spray fittings over the corrugating roll of this single facer at Ohio Boxboard Co. Control for straw oil is mounted above right. Oil-Mist unit at left end of machine lubricates roll bearings.

# Oil-Mist Lubrication of Single Facer Improves Corrugated Production

**These operating facts supplied by Ohio Boxboard and Stewart-Warner Corp. will prove instructive to the many producers of corrugated board.**

Oil in mist form is resolving two important jobs in the operation of the Langston single facers in the container division of Ohio Boxboard Co., Rittman, Ohio. In addition to delivering straw oil to the corrugator rolls with the Alemite Oil-Mist lubricator, this plant is using Oil-Mist to lubricate the antifriction bearings on which the rollers of the corrugating units turn. In all, this equipment is installed on four Langston single facers (two 78-inch machines and two 63-inch machines).

The most newsworthy feature of these installations is the mist lubrication of the corrugating rolls. The Alemite units have been adopted to replace the conventional oiling system with which the single facers were originally equipped.

According to Charles Dressler, maintenance foreman of the container division at Ohio Boxboard, use of Oil-Mist has been "the only successful way yet determined to apply parafine oil to corrugating rolls" here. The following advantages are cited:

**1**—Adhesion of sheets has improved about 30 per cent.

**2**—It is now possible for the single facers to handle corrugating medium of considerably higher moisture content than formerly.

**3**—Based on the present condition of the rolls after more than a year's operation with Oil-Mist lubrication, it is expected that double the former two-year roll life will be attained.

**4**—Improved characteristics of the finished product include better "fluffing-out" at higher speeds.

**5**—Loss of production through breaks on the machine has been reduced. There is now less tendency for the sheets to snap off in the flutes of the corrugator roll.

## Roll Oiling Equipment

Typical of the installations on the four single facers is the one shown in the accompanying photograph.

To serve the corrugator roll, which is 64 inches wide at roller point, 32 Alemite spray fittings "A," with .067" bore, are used. Mist is piped to point of application through a tube from the mist unit above. Using thirty-five to forty pounds of pressure from the house air line, the unit delivers twelve ounces of oil during each nine hour shift. It is solenoid operated, delivering mist only when the machine is running.

## Bearing Lubrication

A second Oil-Mist unit serves the bearings, which are six inches long and four inches in diameter. Heretofore, with the original force feed oilers, a gallon of oil was used each eight hours of operation. Now twelve ounces of a #40 oil are used each eight hours. Housekeeping and temperature improvements are noteworthy, Mr. Dressler states.

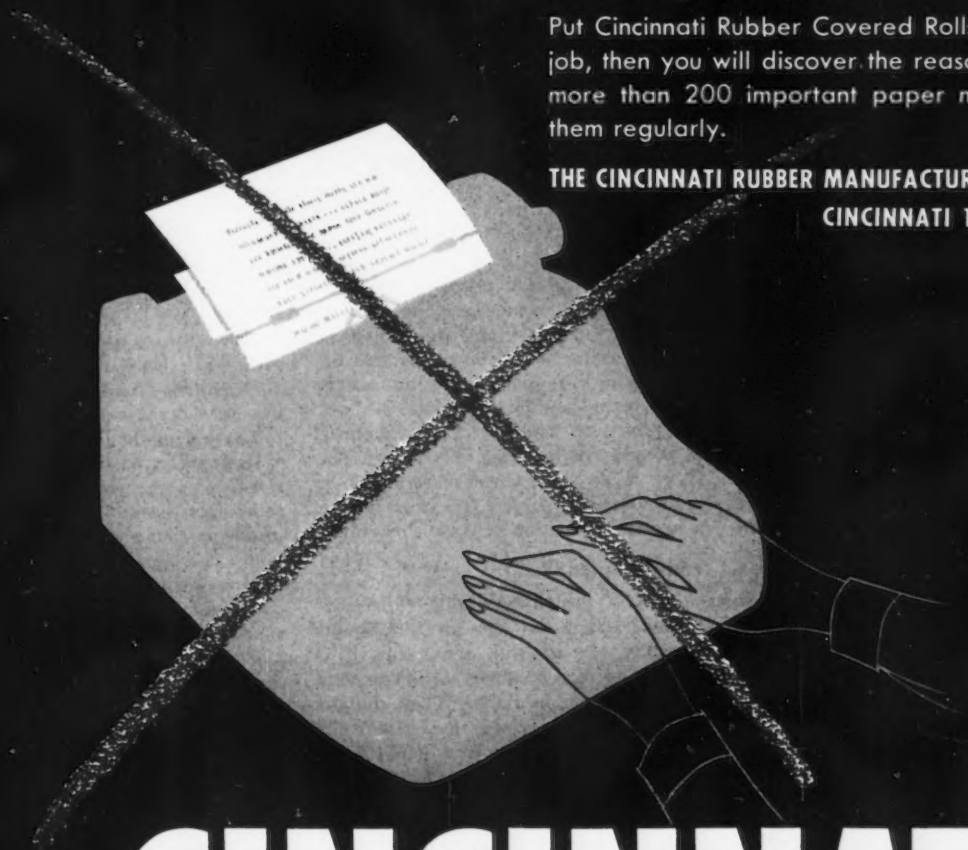
# NO!

Words can't tell the real story...

you have to experience the outstanding performance of Cincinnati Rubber Covered Rolls on your paper machines to really know how good they are.

Put Cincinnati Rubber Covered Rolls on the job, then you will discover the reasons why more than 200 important paper mills use them regularly.

**THE CINCINNATI RUBBER MANUFACTURING CO.**
**CINCINNATI 12, OHIO**



# CINCINNATI

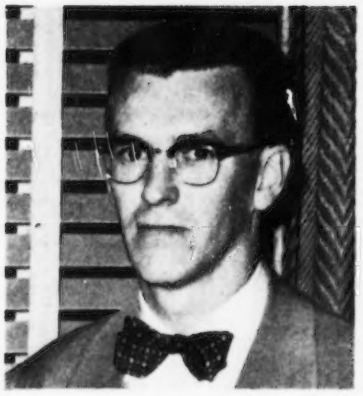
RUBBER COVERED ROLLS

**DURATEX TOP PRESS ROLLS • COATING ROLLS • TABLE ROLLS • SQUEEZE ROLLS**
**SUCTION PRESS ROLLS • PRESS ROLLS • COUCH ROLLS • WORMED FELT ROLLS**
**WORMED CUTTER ROLLS • FELT CARRIER ROLLS • SMOOTHING ROLLS • SIZE ROLLS**

# The Present Status of Pressafiners at Green Bay

**William Nelson**

Technical Engineer, Green Bay Paper & Pulp Co.



**Early reports from Green Bay, Wis., indicate this screw press can aid pollution control in semi-chemical mills.**

The Green Bay Paper & Pulp Co. has been working for the past sixteen months to develop the potentialities of the Pressafiner. This work has been in cooperation with the French Oil Mill Machinery Co., the builders of the press, and Bauer Bros Co., who is handling its application to the pulp and paper industry. During this development period, two Pressafiners were installed, on a temporary basis, to handle part of the production of semi-chemically cooked hardwood chips. In this way a considerable period of time was available to observe operating characteristics, production values, liquor expression rates. This "temporary" development period also permitted an indication of maintenance problems.

On the basis of the experience gathered during this development period, the Green Bay Paper & Pulp Co. ordered two additional Pressafiners and have recently received partial shipment of these presses. The total number of four units are now being permanently installed in the semi-chemical pulp mill. Their most logical position in the operation is the location between the leachcaster pits and the Bauer double disk refiners. The units will be located so that the present stainless screw conveyors can be used to feed the cooked chips to the Pressafiners. The pressed chips coming from these presses are collected in another screw and further transported to the Bauer double disk refiners.

We have found in our experience with the Pressafiner the following factors which made the machine desirable for our operation.

The semi-chemical cooking of hardwoods at Green Bay is done by using an impregnation stage before the actual cook. After satisfactory impregnation, during which time the chips have been fully penetrated with cooking chemicals, the excess liquor is withdrawn from the digester and the cook is made with only the chemicals actually absorbed by the wood. This means that after cooking only a very small amount of waste liquors are free to be removed during the blowdown of the digester. Therefore, the chips are at a moisture content of approximately 55 percent when dumped to the leachcaster pit.

The action of the Pressafiners removes a good deal of the waste liquors held by the chips, and the processed chips are discharged from the press at a moisture of approximately 36 percent. It has been apparent during our experience with the Pressafiners that final moisture of the pressed chips, the production of the machine, and the horsepower requirements per ton of chips handled are variables dependent on each other for any particular mechanical arrangement of the Pressafiner. We have proved to our satisfaction that we can expect a production of 40 tons/24 hours per Pressafiner, on seven percent air dry basis, with an input of 125 hp. on the press when handling chips at 55 percent moisture and discharging material at 36 percent moisture. We expect that if we wish to produce material at 25 percent or 30 percent we must expect a loss in production of each Pressafiner.

## Aids Pollution Control

Because the unit is able to remove a good share of the waste liquors normally carried with the chips, it is possible to recover an important amount of liquors rich in B.O.D. These liquors can, therefore, be separated from the system before dilution and handled according to the methods available to a mill to prevent their entry to and pollution of the river.

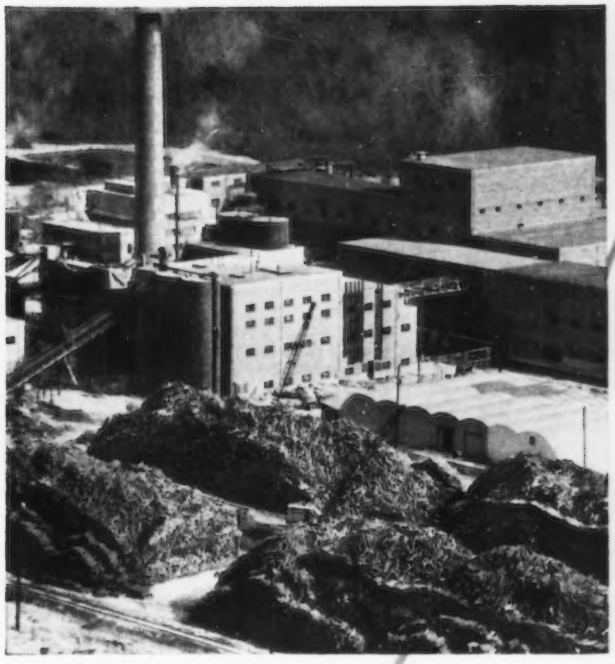
The removal of waste liquors from the chip itself is, we believe, the most efficient method of separating B.O.D. rich fractions from the general mill effluent. The expressed liquors in our particular operation will normally vary in percent total solids, after screening through a 100 mesh wire, from 17 to 20 percent, and will contain 50,000 to 72,000 p.p.m of B.O.D. Although we have not yet completed the permanent installation of the four Pressafiners, we are anticipating our ability to separate and collect approximately 70 percent of our B.O.D. contributing liquors. We expect to handle approximately 40,000 gallons of these liquors per 24 hours.

We believe that our past experience with the Pressafiners has definitely indicated that the pressing operation is in itself a kind of primary refining stage, and opens the cooked chips up so that a more uniform refining can be accomplished by the double disk machines. Therefore, we expect that we will be able to produce a stronger, more shive-free pulp after the Pressafiner installation has been completed. It has also been indicated that a power savings in overall refining power requirements can be expected. We do not have specific data on these items as yet due to the nature of our temporary installation. Therefore, it is impossible at this stage to give information on a before and after basis since the data we have, has been gathered under conditions dictated by our development installation and processing method.

During the past year of development work, a prime consideration was the satisfactory solution to various corrosion problems connected with the Pressafiner unit. The nature of a screw press operation when combined with the severly corrosive nature of semi-chemical liquors construction of all parts of the press are of 304 or 316 stainless, and those parts that are subjected to mechanical erosion as well as corrosion are of various type Stellite metals. The overall performance of these corrosion and wear resistant materials seems to be very good. We feel that there are certain mechanical changes that can be made to improve the service of the Pressafiner for this particular application. These are now being worked out in cooperation with Bauer Brothers and the French Oil Mill Machinery Co.

We expect our installation to be completed within the next sixty days and during the period following that, we at Green Bay will be able to develop more specific data on the various advantages of this equipment in its application to the pulp industry.

*Oh, I see*



**. . . they're using our valves at Riegel Carolina . . .**

OIC iron valves, steel valves, bronze valves—you see hundreds of them all through this amazing new plant of the Riegel Carolina Corporation near Acme, North Carolina. The OIC Long Line of Valves—proved dependable in years of similar service—enabled Piping Equipment Company of Greensboro, North Carolina, to meet every kind of flow problem in this pulp mill.

**THE OHIO INJECTOR COMPANY • WADSWORTH, OHIO**

OIC FOUNDED 1883

**VALVES . . . FORGED & CAST STEEL, IRON & BRONZE**

# NEW EQUIPMENT AND SUPPLIES

**Manufacturer's Reports**

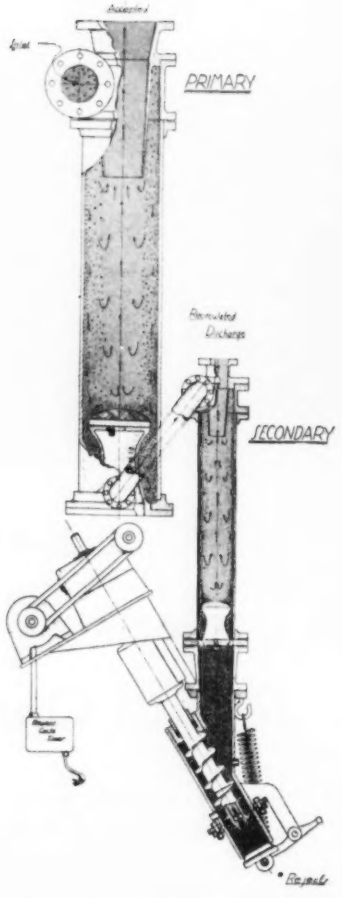
## Larger Dirtec And New Uses Developed

Two new developments in the manufacture and application of Dirtec centrifugal-type cleaners have been revealed by the manufacturer, Bird Machine Co., South Walpole, Mass.

Recently introduced is the "King-Size" Dirtec, designed to clean 1400 gallons of stock per minute, with negligible loss of fiber in the results. The new large size unit is shown in cross-section in the accompanying cut. It consists of a 12-inch primary cylinder and a 4-inch auxiliary cylinder, and is equipped with a continuous evacuator for automatic removal of coarse, heavy dirt. The dirt is removed virtually dry, it is said.

It is reported that the units were particularly designed for handling the volumes of relatively dirty stock that are encountered in many board making operations. The company states that a number of these units are already in operation in the field and are collectively handling between 75 and 100 million gallons of stock daily.

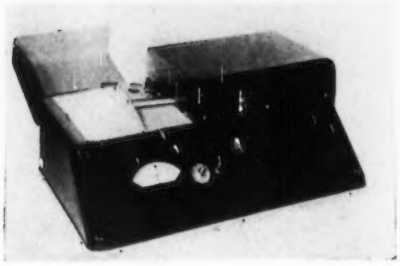
The second development is the application of Dirtecs to millwater supply lines, such as from well water where considerable fine sand and grit is a serious problem. In one mill, a single installation of a 6-inch primary and a 2-inch secondary is said to be removing thoroughly the sand and grit in the fresh water line.




### Meter to Measure Paper "Feel"

The J. & J. Handle-O-Meter, originally developed by Johnson & Johnson to measure the "hand" or "handle" qualities of textiles, is now available to measure the feel of paper. The meter is said to perform an evaluation of the *combined* flexibility and surface friction of a given sheet. This combined rendering is said to be valuable, because the two qualities are judged in combination by a consumer, not individually. The instrument is available from Thwing-Albert Instrument Co., Penn St. at Pulaski Ave., Philadelphia 44, Pa.

The meter as illustrated is ready to make a test. The specimen to be tested covers the slot (0.250″ wide) extending across the platform. The penetrator arm is pivoted in the body of the instrument in such a way that it pushes the specimen into the slot. Two factors affect movement of the penetrator arm into the slot, flexibility (for flexural rigidity), and surface friction.



With any given width of slot, a stiff material will resist the movement of the penetrator more than a soft material. At the same time, a rough material will resist being dragged over the square edge of the slot more than a smooth material. The strain gage detects these two resistances and an electric meter indicates the sum of these resistances.

### Magnetic Hump Cuts Stock Pump Damage

Eriez Mfg. Co. reports as follows on the operation of its recently developed Magnetic Pressure Hump in an eastern paper mill.

A large paper mill in the east making book and magazine grades, was experiencing so much damage to stock pumps from bailing wire and other forms of tramp iron in the white water lines, that the pumps had to be serviced four to five times a week, with labor and downtime averaging about one hour for each service job. The final cure was found when an Eriez permanent magnetic pressure hump was installed in the line at a point following the beaters and ahead of the jordans.

According to the company's plant engineer, this magnetic separator is now removing approximately two bucketfuls of tramp iron per month. He estimates that in less than two years time the increased life of the pump, elimination of downtime and reduction of white water waste will more than pay for the entire installation.

Mount Hope FREE WHEELING EXPANDERS

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Cloth, Paper & Plastic Handling Devices

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## DO YOU KNOW WHERE YOUR PLANT LOSES MONEY?

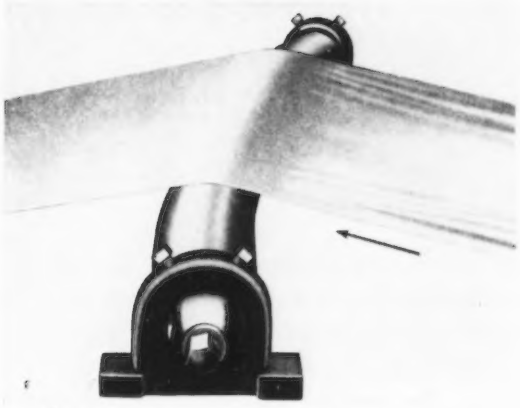
From headbox to reel, you can trap "Lost Profits" with the Mount Hope System. Ask our Cost Production Expert — no obligation!

## FREE WHEELING EXPANDERS

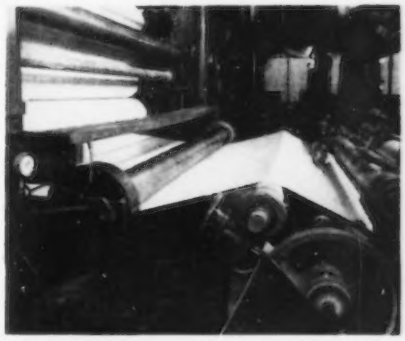
- Cut Production Costs
- Improve Product Quality
- Increase Efficient Life of Paper Machine Felts

**USED BY PAPER MAKERS** to maintain maximum width of paper, eliminate creases, wrinkles and distortion during manufacturing. To help clean and improve handling of paper machine felts.

**USED BY CONVERTERS** to eliminate creases, wrinkles, distortion and baggy edges during converting process.



THERE is a Mount Hope Spreader Roll to handle every type of wrinkling, creasing and spreading application. Shown here are typical installations used by leading paper manufacturers and converters.



LEFT BELOW—Top felt of a cylinder machine at John Stranger Paper Co., Menasha, Wis.

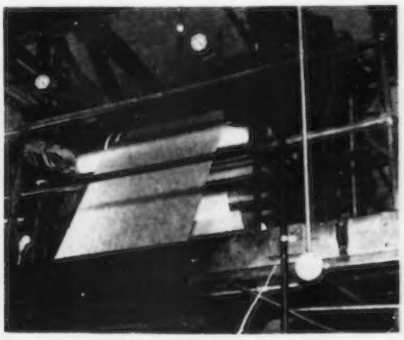
CENTER BELOW—Super Calender Installation, Nicolet Paper Company, West DePere, Wis.

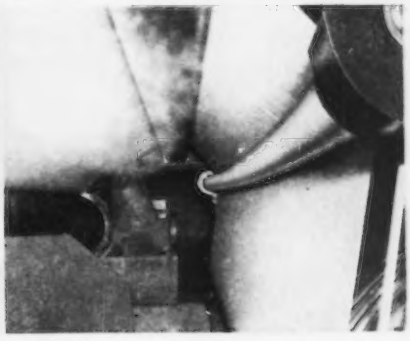
UPPER RIGHT—Slitter Installation, S. D. Warren Co., Cumberland Mills, Me.

CENTER RIGHT—Rewind Installation, S. D. Warren Co., Cumberland Mills, Me.

LOWER RIGHT—247" 7" OD Expander on Size Press at Champion Paper & Fibre Company, Canton, North Carolina.

Write Dept. X for free bulletins or information





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## ...and Du Pont makes it!

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YOU GET a titanium dioxide pigment which is specifically adaptable to paper manufacture. It disperses easily in water, has fine beater retention, low-water and adhesive demand—all of the important features needed for easy and sure use in paper furnishes and paper coatings. It's the best $TiO_2$ for paper we have ever made!

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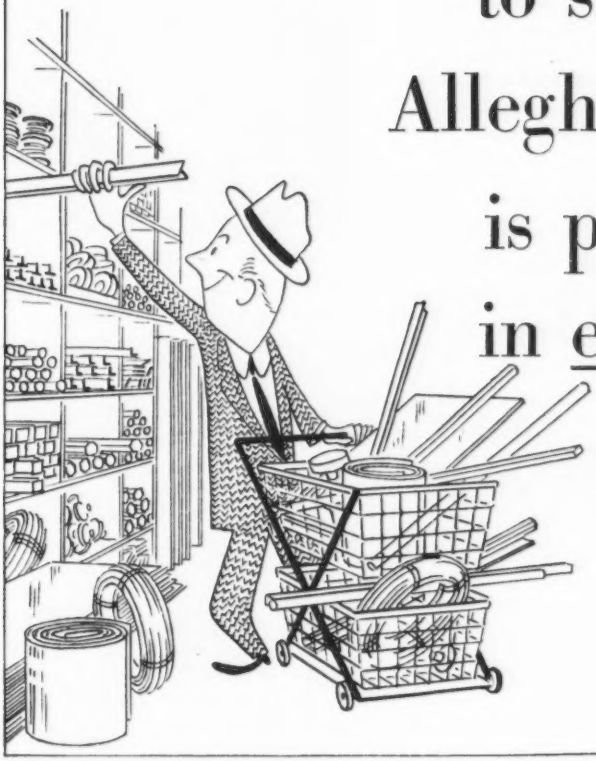
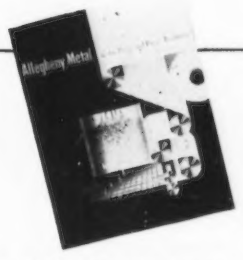
# You don't have to shop around... Allegheny Stainless is produced in every form you may need



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**"ALLEGHENY METAL in the Pulp and Paper Industry"**

An interesting and informative 36-page booklet on the uses and advantages of Allegheny Metal in pulping and paper-processing equipment. Well illustrated, contains a technical section on selection of stainless grades, fabricating details, etc.

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WHATEVER your stainless steel requirements may be, you can satisfy them with Allegheny Metal.

It's produced in any grade, form or finish you want—from the finest wire to heavy plates, castings and forgings, including sheets, strip, bars, shapes, tubes—*everything!*

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Complete technical and fabricating data—engineering help, too—are yours for the asking. Just keep it in mind to specify "Allegheny Metal" when you're in the stainless market. And remember, wherever you use it, Allegheny Metal looks better, lasts longer, usually works out to be cheaper in the long run. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

You can make it **BETTER** with

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AL TIME-TESTED STAINLESS STEEL

**Warehouse stocks carried by all Ryerson plants**

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## NEWS OF SUPPLIERS

• ALLIS-CHALMERS general machinery division has announced the following appointments to the staff of C. W. Schweers, vice-president and direstor of sales:

O. V. Tally, director of industrial sales; J. S. Morgan, director of utility sales; and W. L. Manly, director of general purpose equipment sales.

Announcement was also made of the formation of a new Northwest region under the management of M. M. York, formerly New England regional manager. This region will include the Chicago, Milwaukee, Minneapolis, Duluth, Davenport, Des Moines, Peoria, and Rockford offices with headquarters in Chicago.

J. H. Burrus, Jr., formerly Milwaukee district office manager, has been named manager of the Midwest region succeeding Tally, who held the post since 1950. This region now consists of the St. Louis, Indianapolis, Evansville, Louisville, Kansas City, Wichita, and Omaha offices, as well as the Memphis district. Headquarters are in St. Louis.

John E. Smet, formerly manager of the Hartford district office, was appointed manager of the New England region succeeding York.

**D. R. Simonds**

• BELOIT IRON WORKS, Beloit, Wis., has appointed Donald R. Simonds assistant sales manager. Mr. Simonds has been a sales representative for several years and previously served in Beloit's engineering department. Mr. Simonds brings to his new position a practical background of engineering experience in both paper making and paper converting fields, including five years as chief engineer of a printing paper mill in the East.

**C. B. Neill, Jr.**

• WILLIAM POWELL CO. has appointed C. Barry Neill, Jr., of Decatur, Ga., to the position of sales representative of Powell Valves as part of a company-wide sales expansion program.

Mr. Neill, who represented Taylor Forge and Pipe Works of Chicago from 1949 to 1953, is well known throughout the Southeast. He will service the industry in Alabama, Georgia and Mississippi.

• I. RUSSELL BERKNESS CO., 615 E. Franklin St., Richmond, Va., who represent Warren and Warren-Quimby Pumps in Virginia, have added Robert Q. Collier to their engineering staff as of May 1.


MAKERS OF

*Quality Papers*

KNOW FROM EXPERIENCE

THAT

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STARCHES AND GUMS

MEET THEIR

SPECIFIC REQUIREMENTS

**CLINTON FOODS INC.**

**CORN PROCESSING DIVISION**

CLINTON, IOWA

• HEYDEN CHEMICAL CORP. has elected Kenneth M. Irey assistant vice-president.

Mr. Irey, who joined Heyden in 1949, has been chemical production manager since 1953. Previously, he served as assistant manager of Heyden's Garfield, N. J., plant.

• A. E. STALEY MANUFACTURING CO., corn and soybean processor, has appointed Ralph R. Dombroski as acting manager of its San Francisco branch sales office.

Mr. Dombroski, who has been the Staley industrial sales department representative in Los Angeles, succeeds Ronold W. Murphy who has resigned to become sales manager for the Leslie Salt Co. Mr. Dombroski has been with the Staley Co. since 1942 and was an industrial sales representative in Chicago bebore going to Los Angeles.

Staley also announced the appointment of Don D. McCaleb as assistant manager of the San Francisco office. Mr. McCaleb, a Staley employe since 1945, has been a territory manager and supervisor of the company's package products sales department at Grand Rapids, Mich.

• J. O. ROSS ENGINEERING CORP. announces that Charles R. Herter has joined its organization as a sales engineer in its Detroit office. Mr. Herter was an industrial engineer for Johns-Manville before joining Ross.

• HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y., has promoted Harris C. Miller from sales representative in the New York District to assistant district sales manager of the company's New York district sales office. Dr. Frank W. Long of Niagara Falls has been transferred from the research and development department to the sales development group of the sales department.

Since 1949, Mr. Miller has been a sales representative of the company with headquarters most recently at the New York district office.

Dr. Long, after positions with several large companies, came to Hooker in 1953 as a chemist in the plastics and resins group of the research and development department.

• ORR FELT & BLANKET CO., Piqua, Ohio, has appointed L. V. (Luke) Thiel Pacific Coast representative, effective May 1.

Mr. Thiel has spent a number of years calling on mills in various parts of the country on matters pertaining to machinery as well as felts. He will make his headquarters temporarily at the Multnomah Hotel, Portland, Ore., and in June the family will join him and will locate in the vicinity of Camas, Wash.

YOU THINK
GORILLAS ARE TOUGH!

They are. But we're not suggesting that you try to cage one with MEAD Chestnut Cores. We're merely pointing out that MEAD's blend of chestnut and other hardwood fibers, teamed up with spiral construction, produces cores of exceptional strength and rigidity.

Would you like a free sample exactly suiting your requirements (no obligation)? Just send us your specifications, including length, diameter and wall thickness.

MEAD Chestnut Cores

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43 Leon Street, Boston 10, Massachusetts

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METALS — I.B.B.M., all iron, bronze or stainless steels, body parts plain or rubber lined.

*The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.*

- The "FAST THREADED" screw stem and ball bearing speeds valve operation.
- The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
- The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
- Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

*"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS"*

**RECORD FOUNDRY & MACHINE COMPANY**

LIVERMORE FALLS, MAINE, U. S. A.

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DIXIE • KOSMOS
PARIS BLACKS

Carbon blacks for all paper and board stocks—outstanding soft texture, particle fineness and jet black color. Takes well to the fiber, shows high retention.

Best for performance in the Beater and Jordan because of ease of wetting and ready dispersion in the furnish.

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BLEACHED KRAFT PAPERBOARD

## "SOUTHEASTERN STATES FARING BETTER," RUNS RECENT HEADLINE

There's an explanation for this: Lower costs—profitable operations.

Industry is growing apace in the Seaboard Southeast where basic factors contribute to lower manufacturing costs.

Let us supply you with details on outstanding sites in this favored area. No obligation, and all negotiations confidential.

Warren T. White, Assistant Vice President
Seaboard Air Line Railroad Company
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AIR LINE RAILROAD
THROUGH THE HEART OF THE SOUTH

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**Mill Roll Headers**

Here is the modern, cost-saving method of header labeling . . . and portable to move right to the rolls being "headed." Patented regulator applies controlled film of glue.

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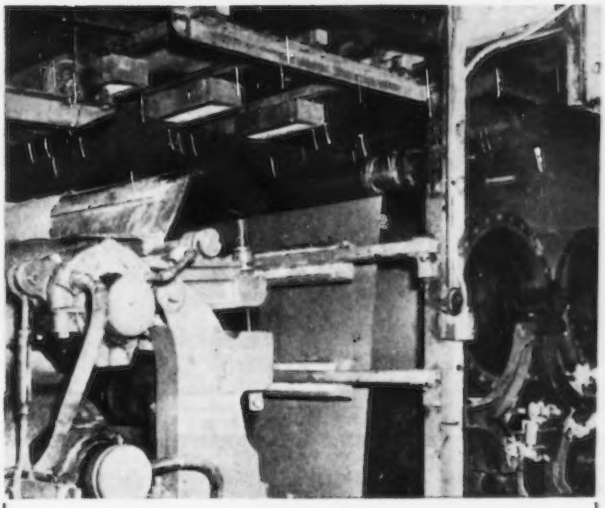
**POTDEVIN MACHINE CO.**
223 North Street • Teterboro, N. J.
*Designers and manufacturers of equipment for Bag Making, Printing, Coating, Laminating, Gluing and Labeling*



**RED RAY BURNERS**
**Installed between Press and 1st Dryer**
**Heat applied to both sides of the web.**

Simple, economical means of increasing drying capacity. Installations include automatic controls and safeguards. Write for bulletins.

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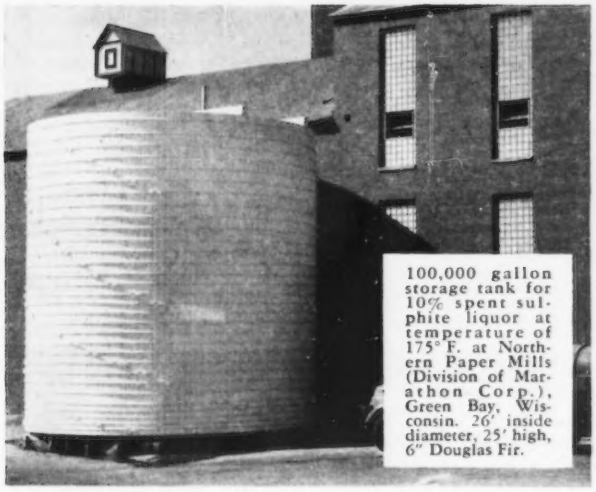
**BIG TANKS... or small**

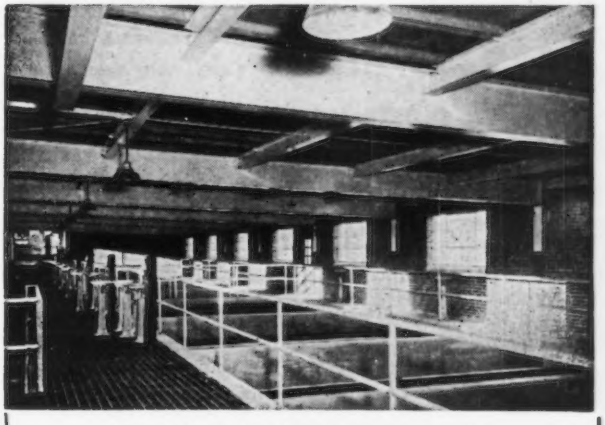


100,000 gallon storage tank for 10% spent sulphite liquor at temperature of 175° F. at Northern Paper Mills (Division of Marathon Corp.), Green Bay, Wisconsin. 26' inside diameter, 25' high, 6" Douglas Fir.

***Kalamazoo* WOOD TANKS**
*. . . quality-built to your specifications*

Engineering experience, craftsmanship, selected top-grade tank lumber . . . your guarantee of satisfaction. For large tanks or small, see *Kalamazoo* first. Free estimates and suggestions.

WOOD TANK DIVISION
***Kalamazoo* TANK and SILO CO.** 825 HARRISON STREET KALAMAZOO, MICH.



Concrete Gravity Air-Water-Wash type water Filtration Plant producing, at low cost, water with turbidity 0, color under 5 and iron 0.05 p.p.m. Fe.

**OTHER PRODUCTS**
**Demineralizing Plants**
**Water Softening Plants**
**Pressure Filter Plants**
and

All other types of water treating systems, including strainer valves, air wash systems, filter sand and anthracite beds and all filter repair and replacement parts. Over 50 years experience building new and modernizing old water treatment plants.

***Write for FREE Bulletins***

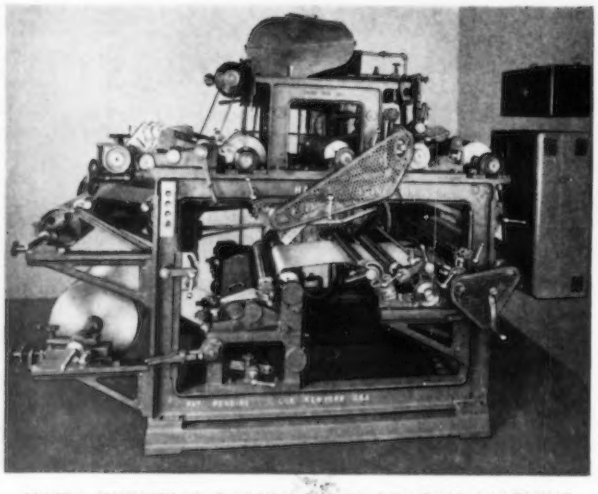
WAT SERVICE
**HUNGERFORD & TERRY, INC.**
CLAYTON 4, NEW JERSEY

# ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS TRADE MARK

**UNIFORM SUPERIOR DEPENDABLE**

**English China Clays Sales Corporation**
**551 Fifth Avenue, New York City**



**HAIDA UNIVERSAL CARBON PAPER COATING MACHINE**

*Complete plants for the manufacture of:*
One-Time Carbon, Typewriter Carbon, Pencil Carbon, Hectograph Carbon, Dry Stencils, Typewriter Ribbons.

**MANUFACTURING INFORMATION and FORMULAS FURNISHED**

## HAIDA ENGINEERING CO.

34-11 Vernon Boulevard, Long Island City 6, New York

*Get better paper with fast slaking, low residue*
**Gold Bond® CHEMICAL LIME**

Uniformity and purity of Gold Bond quicklime and hydrate help achieve very high specific surface coatings. Lime variables and impurities are eliminated by rigidly controlled processing steps. You are assured of consistent high quality in every shipment... for National Gypsum alone offers a complete line of *tested* lime products: Gold Bond High Calcium and Dolomitic quicklime and hydrate.

*Industrial Division*
**NATIONAL GYPSUM CO., BUFFALO 2, N. Y.**

Gold Bond INDUSTRIAL PRODUCTS

## "EXCELSIOR" FELTS

EXCELSIOR KNOX Woolen Co. Camden Me. FELTS & JACKETS

**The Trademark of Felts of Superior Quality for Every Grade of Pulp and Paper**

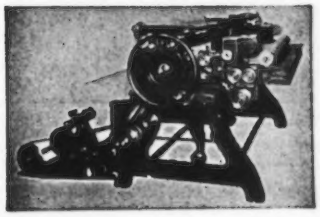
## KNOX WOOLEN COMPANY

CAMDEN, MAINE

# STANDARD & FACIAL TISSUE ROLL CONVERTERS

**WITH OR WITHOUT**

**Latest Improvements: Parent Roll Drive with Automatic Tensioning — Velvet Smooth, Quick Accelerating Clutch**



Slitters and Rewinders for Vulcanized Fibre and Heavy Board

•

Towel Interfolders for single interfold

•

Special Machinery

Rotary Card Cutters

•

Spiral Tube Machines for Toilet Roll Cores

•

Designing

## DIETZ MACHINE WORKS

**Factory-Office: 126 W. Fontaine St.**

**SINCE 1901** **PHILADELPHIA 22, PA., U. S. A.**

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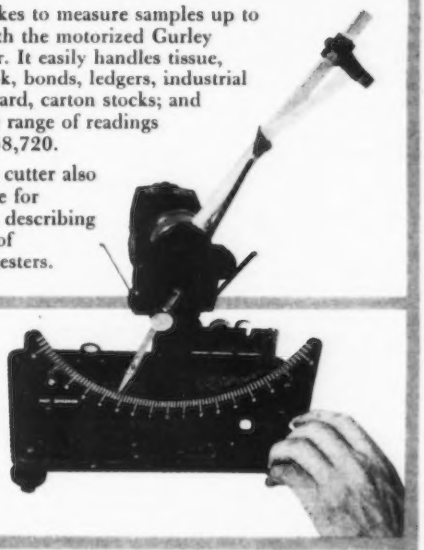
# 21 SECONDS *to Test Stiffness of Paper and Paper Board*

That's all it takes to measure samples up to 0.25" thick with the motorized Gurley Stiffness Tester. It easily handles tissue, newsprint, book, bonds, ledgers, industrial papers, cardboard, carton stocks; and permits a wide range of readings from 1 to 3,358,720.

Precision strip cutter also available. Write for Bulletin 1400, describing complete line of Gurley paper testers.



W. & L. E. Gurley, *520 Fulton Street, Troy, N.Y.*

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WESTVACO QUALITY

## WEST VIRGINIA PULP and PAPER COMPANY

*Manufacturers of Printing and Converting Papers*

SUPERCALENDERED • POSTER • BOND • COVER
LITHOGRAPH • LABEL • OFFSET • MUSIC • WRITING
EGGSHELL • INDEX BRISTOL • CUP AND CONTAINER
ENVELOPE • MIMEOGRAPH • FILE FOLDER • COATED
ENGLISH FINISH • POSTCARD • MACHINE COATED

**KRAFT LINER BOARD • SEMI-CHEMICAL CORRUGATING BOARD**

**KRAFT CONVERTING AND KRAFT ENVELOPE**

**MILLS**

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

**WEST VIRGINIA PULP and PAPER COMPANY**

**230 Park Avenue, New York 17, N. Y.**

35 East Wacker Drive, Chicago 1, Ill. 503 Market St., San Francisco 5, Calif.

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## WILLIAMS-GRAY CO.

221 North LaSalle Street, Chicago 1, Illinois

Paul Foster
Peter Talbot
Ross Lawrence
Herb. Fishburn

Lindsay & Niagara Wires
Knox "Excelsior" Felts
Siamese & Richland Dryer Felts
Carrier Rope
Splicing Tissues
Deckle Webbing
Etc.

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## CHEMIPULP PROCESS INC.

**500 WOOLWORTH BUILDING** **WATERTOWN, NEW YORK**

***CHEMICAL PULPING PROCESS***

Hot Acid Cooking and Recovery Systems
Chemipulp—K-C Digester Circulating Systems
Chemipulp—K-C Improved Acid Plants
Digester Waste Liquor $SO_2$ Gas and Heat Recovery
Chip Pretreatment Preparatory to Cooking

***Associated with***

**CHEMIPULP PROCESS LTD.**

**403 CRESCENT BUILDING** **MONTREAL, P. Q.**

***Pacific Coast Representative***

**A. H. LUNDBERG**

**308 ORPHEUM BUILDING** **SEATTLE 1, WASH.**

# PAPER TRADE JOURNAL CLEARING HOUSE PAPER TRADE JOURNAL

**RATES FOR ADVERTISING** (PAYABLE IN ADVANCE)

$.75 cents per line (6 words to line) minimum charge $3.75
—Additional charge of 70 cents if box number is used

Situation wanted advertisements can be repeated for ½ rate

Space in this section can also be purchased at $5.00 per column inch—(1" x 2¼")

Address replies to advertisements appearing under Box Number in care of **PAPER TRADE JOURNAL, 15 West 47th Street, New York 36, N. Y.**

## HELP WANTED

### CONFIDENTIAL EMPLOYMENT SERVICE

For paper and pulp mills and paper converting plants. Our service is rendered without charge to employers seeking executives. No charge to applicant until position is accepted. We invite your inquiries.

CHARLES P. RAYMOND SERVICE, Inc.
Phone: LIberty 2-6547
294 Washington St., Boston 8, Mass. M-14

WANTED—Aggressive production superintendent, not over 45, for two machine, middle western mill, making the better grades of book and offset papers. Prefer man now employed possibly as assistant who feels there is no immediate chance for promotion. Must have had considerable paper machine experience. Thus capable of instructing machine crews in best methods for efficient production. Chemical knowledge not a requisite. Our vacancy due to intended promotion of our present supt. In application please be detailed in outline of your working record and state salary desired. Your letter will be treated in strict confidence. Address reply to Box 54-178 care Paper Trade Journal. M-28

### WANTED — SALES ENGINEER

Stock preparation machinery and equipment for the peper industry. Mechanical Engineering, papermaking and sales experience desired. Excellent future and job security. Send resume of qualifications and experience to Box 303, Monroe, Ohio. J-4

WANTED—MANUFACTURERS REPRESENTATIVE for the sale of high-grade imported mechanical straight and circular knives for the pulp — paper — woodworking — lumber — veneer — metalcutting industries — exclusive territories open. Fast delivery, competitive prices, liberal commission. GAILLET & HARTIG CO., INC., 250 Park Avenue, New York 17, N. Y.

### TOUR BOSS

in mill making high-grade specialties. Interchangeable shifts 4 P.M. to 12 and 12 to 8 A.M. Good opportunity for person qualified. If interested give age, experience and advise if presently employed. All information will be in strict confidence. Address Box 54-182 care Paper Trade Journal. M-21

## HELP WANTED

### CHEMIST OR CHEMICAL ENGINEER

Opportunity available for Chemist or Chemical Engineer in an expanding pulp and paper mill located in the Middle Atlantic States. Age 25-35 years with several years experience in pulp and paper chemicals and fibers. Good salary with excellent opportunity for advancement. Send resume of educational background and industrial experience. All replies confidential. Address Box 54-183 care Paper Trade Journal. M-28

### PERSONNEL SERVICE ASSOCIATES

115 STATE ST., SPRINGFIELD 3, MASS.
TEL. 6-4749

Confidential Placement Service for the Pulp, Paper and Converting Industries. Administrative—Technical—Production—Sales. We endeavor to establish satisfactory contacts for employers and employees. Inquiries welcome. M-14

### MACHINE TENDER

EXPERIENCED ON CYLINDER MACHINE MAKING FOLDING BOARD. GOOD LIVING AND WORKING CONDITIONS. LIFE INSURANCE AND HOSPITALIZATION. STEADY EMPLOYMENT, GOOD PAY. BOX NO. 54-175 CARE PAPER TRADE JOURNAL. M-21

### MACHINE TENDER

FOLDING BOX BOARD MACHINE, SIX CYLINDERS. ALL FRINGE BENEFITS INCLUDED. FULL TIME EMPLOYMENT, EXCELLENT WORKING CONDITIONS, GOOD WAGES. APPLY TO MORRIS PAPER BOARD CO., 177 THIRD AVENUE, PATERSON, N. J. M-21

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. 663 Brisbane Bldg., Buffalo 3, N. Y. M-14

WANTED—Experienced Machine Tender for Tissue Mill. Plant located in Pacific Northwest. Address Box 54-142 care Paper Trade Journal. M-14

SALES REPRESENTATIVE: Experienced in selling Resin Coated and Printed Paper. Knowledge of specialty bags helpful. Age 30 to 45. Progressive company—opportunity for advancement. Salary open—liberal management benefits. Send complete resume with recent snapshot to Box 53-423 care Paper Trade Journal. TF

ARE YOU A CONVERTER—and would you like a permanent connection wtih a mill in the middlewest, established for several years, making the highest grades of coated and uncoated boxboard? If so, please write at once to Box 54-162 care Paper Trade Journal. M-21

CHEMIST—To develop specialized coating for paper application. Must have previous experience in field and be familiar with all types of coating equipment. Salary commensurate with ability and experience. When replying, specify types of coatings worked on. Excellent opportunity. Address Box 54-172 care Paper Trade Journal. M-21

## HELP WANTED

ASSISTANT SUPERINTENDENT preferred with degree in Paper and Pulp making and with ten years practical experience in Fine Paper Mill. Must be familiar with Converting operations and have experience in working with standards. Must be capable of handling labor. Excellent opportunities for advancement within short time to Superintendent and Plant Manager. Write Box 54-174 care Paper Trade Journal. M-21

WANTED — Experienced Finishing Supervisors for wax paper or tissue. Plant located in Pacific Northwest. Please address reply to Box 54-164 care Paper Trade Journal. M-21

WANTED SALESMAN—Number of choice territories open for live wire men. Represent nationally known line of Shelf Lining Paper, Fibrelin Window Shades and Pine Tar Moth Proof Papers. Write in detail—Glo-Mar Paper Products, 59 Chestnut St., Weehawken, N. J. M-14

## SITUATIONS WANTED

### PRODUCTION SUPERINTENDENT

Twenty-five years of practical experience on large rapid running eight-cylinder machines manufacturing high grade folding boxboard & frozen food cartons of all kinds from virgin pulp and old paper stock. Aggressive, capable man, references. Address box 54-152 care The Paper Trade Journal. J-4

### GENERAL MANAGER

of fully-integrated pulp and paper manufacturing company, now available as result of merger, seeks opportunity to demonstrate to small-to-medium-sized paper manufacturer methods used to achieve corporate earnings rate substantially above that of principal competitor and that of integrated industry nationally; available as consultant or on permanent basis. Address Box 54-167 care Paper Trade Journal. M-21

ADMINISTRATIVE MECHANICAL ENGINEER—37, with 15 years broad experience in engineering, supervision and equipment sales, all grades digester to reel, desires change for greater opportunity as operations supervisor or executive assistant. Address Box 54-161 care Paper Trade Journal. M-14

EXECUTIVE MANAGER—Paper, Board and Conversion; seeks Change for opportunity. Highly qualified in all phases of management; administration; and production. Address Box 54-140 care Paper Trade Journal. M-28

PULP AND PAPER GRADUATE—Twelve years experience product and machine development, process design and management. Seeks change with progressive concern. Address Box 54-176 care Paper Trade Journal. M-28

## FOR SALE

FOR SALE—72" Cameron Slitter & Rewinder; Potdevin F & S Bag Machine range as model 101 with or without Potdevin 2 Color Aniline Printer (Rebuilt); Thomson Platen Die Cutter 26 x 38; 32" Rutherford Roller Coater; Seybold 4 Post Die Cutters 44 x 30 x 38 x 24; Standard and Universal Brightwoods; N. J. Pony Lebelrites. Also many Set-up, Folding and Corrugated Box Machines. Address Box 54-184 care Paper Trade Journal. TF.

**1—Sandusky Suction Press, 162" drilled face x 22" diameter with roller bearings.**

## FOR SALE

**BARKING DRUM**
1—10' x 30'.

**BEATERS**
2—1500 lb. Dilts iron tub beaters, rolls 52" diameter x 42" face.
1—Noble & Wood Beater roll and stand. 70" diameter x 44" face.
2—Breaker Beaters—52" diameter x 48" face rolls.
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54" x 48", cast iron tubs, with motors.
Write us regarding your requirements.

**BREAKER STACK**
1—110" face 2 roll breaker stack, with frames.

**CALENDER STACKS**
1—4 roll 72" Calender Stack. (Extra heavy duty).
1—3 roll 60" Friction Calender Stack, Two iron rolls and 1 Paper or Cotton Roll.
1—5 Roll 86".
1—5 Roll 90".
1—9 Roll—86" face, Super Calender Stack.

**CHIPPERS**
1—88" Carthage 4 knife Chipper.
1—96" Murray 4 knife Chipper—anti-friction bearings.
1—84" Carthage 4 knife Chipper.

**CLASSIFINER**
1—Dilts Classifiner, practically new, with motor.

**CORE MACHINES**
1—Dietz Core Machine (Tube Winder).

**CRUSHER & HAMMERMILL**
1—Murray Chip Crusher.

**CYLINDER MOULDS**
2—30" diameter x 72" face.
1—30" diameter x 92" face.
2—36" diameter x 54" face.
2—36" diameter x 84" face.
2—36" diameter x 86" face, with vats.
6—36" diameter x 110" face, with 24" diameter face couch rolls.
1—48" diameter x 117" face.
2—36" diameter x 136" face with anti-friction bearings.

**DIGESTERS**
2—14' Globe Rotary Digesters.

**DRIVES**
1—Jones Reducer 75 h.p.—30.8 to 1.
1—Jones 21—H.P., ratio 10 to 1.
1—#4 Reeves Drive.
1—Vaughn 100 H.P. enclosed drive Ratio 7 to 1.
2—Cleveland agitator drives, for chests.
2—Waterbury Hydraulic Variable speed line shaft drives (from 40 to 100 h.p.).

**DRYERS**
1—Complete unit, consisting of 6 dryers, 36" diameter x 38" face, including frames, gears, anti-friction bearings.
5—24" diameter x 54" face, with bearings.
1—28" diameter x 48" face.
5—28" diameter x 80" face with anti-fraction bearing.
8—36" diameter x 44" face.
1—36" diameter x 67" face.
2—36" diameter x 72" face.
60—36" diameter x 73" face, gears and bearings.
6—36" diameter x 76" face.
1—36" diameter x 90" face.
2—36" diameter x 120" face.
1—48" diameter x 70" face.
2-48" diameter x 88" face. Frames, gears, bearings and felt equipment.
1—48" diameter x 100" face.
1—48" diameter x 106" face.
2—Dryers 48" diameter x 134" face.
1—48" diameter x 144" face.
3—60" diameter x 86" face.

**EMBOSSING CALENDERS**
1—15" 2 roll embosser.
1—40" 2 roll embosser, complete with unwind, rewind and motor.

**EXTRACTOR ROLLS**
1—Extractor roll, 26" diameter x 104" face, with rubber couch roll.
1—Rice, Barton & Fales Extractor Roll, 26" diameter x 104" face, with rubber couch roll.

**FLAT SCREENS**
2—12 plate Flat Screens.
2—14 plate Packer, roller shoes.
1—14 plate flat screen, Packer, roller shoes with scraping device, practically new screen.

**GEARS**
Write us regarding requirements.

**GRINDERS**
2—4 pocket Grinders.
2—3 pocket Grinders.

**HEAD BOX & INLET**
1—Valley Iron Works Inlet complete with head box. 156", all stainless steel.

**HYDRAFINER**
1—Dilts Hydrafiner with motor.

**JORDANS**
1—#2 Emerson anti-friction bearing.
1—#1 Emerson, iron plug, new spare filling.

**LABORATORY EQUIPMENT**
Write us regarding your requirements.

**LAMINATING MACHINE**
1—72" Hudson Sharp laminating machine, reverse coater.

**MISCELLANEOUS**
1—2 ton Philadelphia Chain Block.

**MOTORS**
3—150 H.P. Westinghouse 495 R.P.M. 3/60/440, with starter.
2—50 H.P. Upright motors, air cooled 3/60/440, 1150 RPM (Ball Bearing).
Write us regarding your requirements.

**PRESSES**
Write us regarding your requirements.

**PULLEYS**
Various cone and assorted pulleys.

**PULPERS**
1—Jones Pulper.

**PUMPS**
*Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.*

**RAG CUTTERS**
2—#20 Taylor Stiles, complete with anti-friction bearings.
1—#20 Taylor Stiles Rag Cutter, with motor, including 20 sets of new knives.

**REELS**
1—86" 2 bowl reel.
1—84" 3 bowl revolving reel.
1—123"—3 bowl revolving reel.
1—134"—2 drum.
1—72" Downingtown Reel, 2 bowl.

**REFINERS**
1—12" Wiener Refiner.

**ROLL HEADING MACHINE**
1—Montague header, with air cylinders, heating element, etc., for up to 36" diameter by 82" long roll.

**ROLLS**
1—Rubber Couch Roll—20" diameter x 108" face.
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)
5—Rubber Couch Rolls—24" diameter x 110" face.

**ROTARY SCREENS**
1—Bird, 36" diameter cylinder x 50" long plate, enclosed drive.
Write us regarding your requirements.

**SAVEALLS**
4—Thompson Washers 36" x 110" cylinder, molds, 24" diameter rubber couch rolls.
2—Savealls 36" diameter x 136" face, hollow shaft cylinder molds, anti-friction bearings, iron end vats. Very good condition.
2—Sandy Hill, 36" diameter x 86" face cylinder molds, anti-friction bearings and couch rolls.

**SHAKER ROLLS**
1—134" face x 14" diameter with Messenger bearings.
1—104" face x 14" diameter with Messenger bearings.

**SHEETERS**
1—62" Moore & White Sheeter, layboy, 8 roll back stand.
1— 72" Hamblet Sheeter.
1—100" Moore & White "Simplex" with layboy.
1—140" Hamblet (Simplex).
1—140" Hamblet (Duplex).

**SHOWERS**
5—Bird showers 96" face.

**SHREDDER**
1—#5 Taylor Stiles "Giant" Pulp Shredder.

**SLITTERS & WINDERS**
1—26" Cameron—Type 10.
1—36" Cameron—Type 44-W (Winder only.)
1—42" Cameron—Type 6.
1—56" Cameron—Type 24-2A.
1—62" Cameron—Type 10.
1—62" Cameron—Type 40-1-AF.
1—62" Cameron (duplex)
1—62" Cameron—Type 9-5.
1—72" Cameron—Type 10.
2— 84" 4 drum Moore & White.
2—86" Two Drum Moore & White, 50" diameter rewind.
1—92" Cameron—Type 12
1—106" Cameron—Type 18.
1—104" Beloit two drum winder.
1—106" Cameron—Type 18.
1—108" Sandy Hill winder.
1—118" Beloit 2 drum winder.
1—120" Moore & White, 4 drum winder. diameter rewind.

**STOCK PUMPS**
1— 8 x 18 Shartle Triplex.
2—10 x 10 Beloit Duplex, low type.
2—10 x 20 Shartle Triplex.
1—12 x 20 Shartle Triplex.
*Advise as to your requirements.*

**SUCTION BOXES**
Write us concerning your requirements.

**SUCTION PRESS ROLLS**
1—Sandusky Suction Press Roll 130" drilled face x 14⅝" diameter.

**TABLE ROLLS**
9—154" face x 5" diameter (Brass)
8—148" face x 5" diameter (Brass)
10—150" face x 5" diameter (Aluminum)
Write us regarding your requirements.

**THICKENERS**
1—Sandy Hill Thickener, all Stainless Steel, mold 60" x 101" face, with couch roll. Anti-friction bearings throughout.
1—Pulp Thickener, cylinder mold 48" x 117", with spare cylinder mold.

**TOILET WINDERS**
2—72" Hudson-Sharp (Surface type winder).
4—81" Dietz.

**TRIMMERS**
1—44" Sheridan.
1—60" Guillotine cutter.

**VACUUM PUMPS**
1—#8 Nash Hytor.
1—#9 Nash Hytor.
1—N-82 Nash, for Fulton-Midwest System
1—#6 Nash Hytor "Bronze."

**VIBRATING SCREEN**
1—Tyler Niagara Vibrating Screen, practically new.

**WAXING MACHINE**
1—65" Mayer Waxing Machine.

**WET MACHINE**
1—72" Wet Machine.

**YANKEE DRYERS**
1—106" x 72" diameter.

**Paddy Ross, Pres.** **J. J. ROSS COMPANY** **Ben Kurs, Treas.**

**377 Frelinghuysen Ave.*** **Tel.—Bigelow 3-3720** **Newark 5, N. J.**

Paper Trade Journal, Classified Ads Bring Good Results

## FOR SALE

**FOR SALE**

110" Hamblet Sheeter.
60" Finlay Sheeter.
40" Clark Single Shafter.
48" Kidder model CH Slitter.
28" Hobbs shear cut Slitter.
BACK-STANDS, ANY SIZE MADE TO ORDER

**Thomas W. Hall Company, Inc.**
120 West 42nd St., New York 36
(Plant at Stamford, Conn.) TF

We Invite

**SPECIALTY COATING JOBS**

for the trade

**SOLVENT OR EMULSION TYPE**

**COATINGS—CLEAR OR PIGMENTED**

Roll widths up to 60"

**Plant located in Chicago.**

**PAPER CONVERTING & FINISHING CO.**

118 N. Ada St., Chicago 7 Ill.
TF

## FOR SALE

**FOR SALE**

72—Beloit Dryers, 42" dia. x 118" face, approved for 50 p.s.i. Dryers are complete with bearings, gears, Johnson Joints, intermediate gears, and some Stands.

Please address all inquiries to: — Box 54-74 care Paper Trade Journal.

M-14

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New Improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester 11, N. Y. TF

## FOR SALE

FOR SALE—80" Creper an Waxer complete with Steam Plant. All new equipment. Address Box 53-293 care Paper Trade Journal. TF

**FOR SALE**

1—106" Trim Cameron Slitter. Type 18. Anti-friction bearings throughout. 42" diameter rewind. 2500 F.P.M.

**J. J. ROSS COMPANY**
**377 Frelinghuysen Avenue,**
**Newark 5, N. J.**
**Bigelow 3-3720**

M-14

## WANTED

WANTED—Variable Speed Motor, about 50 H. P., for Paper Machine Drive, with controls. Top machine speed about 250 feet per minute. Also, M. G. set for same. Address Box 54-168 care Paper Trade Journal. M-28

WANTED—15 to 20 Dryers 76" to 80" face, 36" to 48" diameter with frames, gears and bearings. Could use dryer felt rolls and drives for dryers. Address Box 54-169 care Paper Trade Journal. M-28

## FOR SALE

**GRINDERS (Roll)**
Farrel, takes roll 24" x 160".
Farrel, takes roll 36" x 161".
24" x 276" centers Landis.

**GRINDERS (Slitter)**
2—Koegel slitter grinders.

**JORDANS**
2—No. 1 Jones, new 1950, with base and coupling.
1—No. 2 Emerson Junior, base and coupling, new 1948.
1—No. 1 Emerson Junior, anti-friction, 5/16" steel filling.
2—Jones Majestic.
2—Shartle Miami No. 2.
3—Jones Imperial, 3/16" stainless steel filling.
4—Emerson Junior, No. 4, anti-friction bearings.
Noble & Wood Mammoth.
2—Noble & Wood Bulldog.
Union Machine, 1/4" stainless steel filling.
Noble & Wood Mammoth Senior.
No. 2 Emerson, anti-friction.
No. 1 Emerson. No. 1 B Emerson.
No. 1 Claflin with coupling and base.
Shartle No. 1 Hydrafiner with motor.
Four Cowles Claffiners.
3—Mastodon Jordans.

**KETTLES**
Glass lined, steam jacketed, 150 gallons.
Glass lined, 300 gallons.
82 x 22, Glass lined, jacketed.
2 Size tanks, 300 gallons, partially jacketed.
Autoclav, used one week, 10 lb. pressure.
24 x 24 steam jacketed, fifty gallons.
Steel tank, 10 ft. dia. x 10' 6".

**KNIFE GRINDERS**
102" Seybold, three new stones.
100" Hanchett. 40" Springfield.
64" Seybold. 66" Berlin.
30" Bridgeport.

**KNOTTERS**
2—Impco, print available.
3—Trimblay.

**LAMINATING MACHINES**
62" Beloit.
54" Laminator and Combiner.
62" Beloit.
106" Beloit, layboy and roll stands.
84" Moore & White, rebuilt.
56" Moore & White. 80" Moore & White.
94" 8-roll Moore & White, backstand, double deck, 36" roll.

**MACHINE TOOLS**
20" Simonds shaper.
36" Drill press.
32" Drill press.
Cincinnati No. 2 horizontal milling machine.
Pond engine lathe, 36".
Putnam lathe, 10' 6" center to center, swing 32, turns 22" from 36" bed, swings over bed 14".
Sellers planer 10' 6" x 28".

**M. G. SETS**
Allis Chalmers, 500 K W and controls.
Westinghouse, 100 K W.
Westinghouse 95.

**MOTORS**
2—G. E., 125 HP vertical squirrel cage, 550 V, 65 speed full load.
1—500 HP Westinghouse, 2300 V, 200 rpm, synchronous.
2—50 HP, 440 V. 4—100 HP, G. E., 50 V.

**PULPERS**
Kurt Wandell Dynapulper.
2—No. 2 Lannoye pulpers.

**PUMPS (Centrifugal)**
Gardner Denver, size 2½, Type EE, 350 gpm, 60 ft. head.
2300 gpm Gould, 14 ft. head with 30 HP, 440 V motor.
150 gpm Gould, 150 ft. head with 15 HP, 3600 rpm motor.
2—Frederick, 200 gallons, 80 ft. head, 25 HP, 1150 rpm, 440 V motor.
2—7500 gpm, 5 percent stock, 30 ft. head.
500 gallons, 120 ft. head, Warren.
4" x 5" Aurora, 400 gpm, 50 ft head.
500 gallon, 120 ft. head, Warren.
Jennings, 300 gallons, 35 ft. head.

**PUMPS (Plunger)**
7 x 16 Shartle duplex.
2—9 x 16 Downingtown, new 1951.
12 x 12 Gould triplex.
12 x 12 Bagley & Sewall triplex.
10 x 20 Black & Clawson triplex, 4 years old.
2—7 x 9 Gould.

**PUMPS (Vacuum)**
Nash A. L., 1 HP, 220-440 V motor.
No. 1 Nash. Nash L 6.
No. 2 Nash. Nash L 2.
No. 4 Nash.

**RAG CUTTERS**
Taylor Stiles Giant, size 2 B.
Perkins rag cutters Series C, No. 39.

**REELS**
Two bowl Rice Barton, 96".
62" Pusey & Jones drums, 42 x 162".
90" Pusey & Jones drums, 42 x 190".

**REFINERS**
32" Sutherland.
No. 1 Claflin with coupling and base.
4 Cowls Classifiners.
Weiner refiner.
No. 2 Haug refiner with No. 2 drainer.
No. 1 Shartle Hydrafiner, 150 HP, 440 V motor.
Shartle refiner No. 4.
Jeffrey Hammermill, size 24 with 40 HP motor.
3 Haug drainers, size 3. Morden stock maker.

**SCREENS**
2—Ten plate Impco, bronze vats.
1—Twelve plate Impco bronze vat.
1—Twelve plate Impco bronze vat.
1—Ten plate Sandy Hill roller shoe, new.
1—Ten plate Sandy Hill roller shoe, plates cut .012".
2—Fourteen plate Harmon.
2—Sixteen plate Packer.

**SCREENS (Rotary)**
4—Bird 2 A copper vats. 1—Jones Leith Walk.
1—Bird 3 A. 1—Trimbley Senior.

**SCREENS (Pulp)**
2—No. 4 Impco centrifugal.
2—No. 4 Impco centrifugal.
2—Trimbley.

**SLICES**
93" Voith. 153" Voith.153"
143" Rice Barton. 160" Beloit.
143" Voith, new. 206" Voith.

**SLITTERS AND WINDERS**
42" Cameron, type 6.
62" Cameron, type 95.
62" Meisel.
82" Cameron, type 10, model A.
82" Langston. 100" Type 18 Cameron.
106" Type 18 Cameron.
104" Moore & White four drum with slitter part, 7½ HP motor.
107" Moore & White, four drum, anti-friction.
146" Langston, Type D. A., anti-friction.
150" Rice Barton, two-drum, 15" dia. drums.
160" Black & Clawson, two-drum.
186" No. 19 Cameron.

**ROLLS (Suction)**
14½" x 99" Sandusky suction press.
14" x 100" Millspaugh suction couch.
18" x 100" Walmesley suction couch.
3—22" x 128" Downingtown suction extractor.
3—10½" x 138" Downingtown suction felt rolls.
18" x 104" Sandusky suction press.
25" x 152" Sandusky suction press.
30" x 158" Sandusky suction couch.
30" x 161" Downingtown suction couch.
30" x 170" Sandusky press.

**TRIMMERS**
38" Smith & Winchester.
44" Smith & Winchester, power operated back gauge.
44" Oswego. 54" Seybold, New 1940.
48" Seybold. 84" Smith & Winchester.
54" Seybold 84" Seybold.

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72" Rogers anti-friction. 72" Rogers.
72" Rice Barton 84" Bagley & Sewall.

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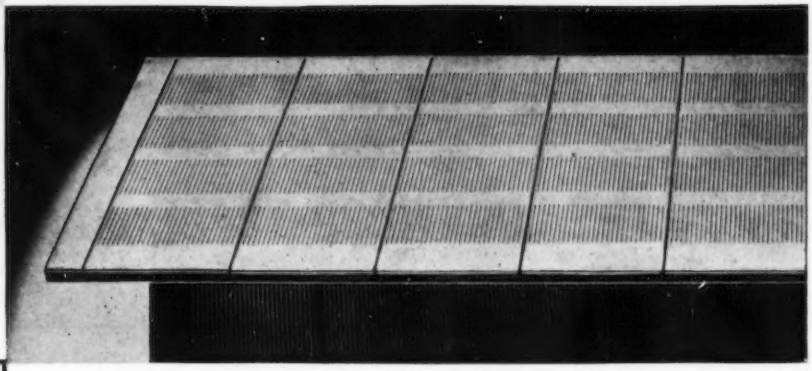

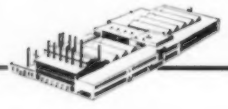

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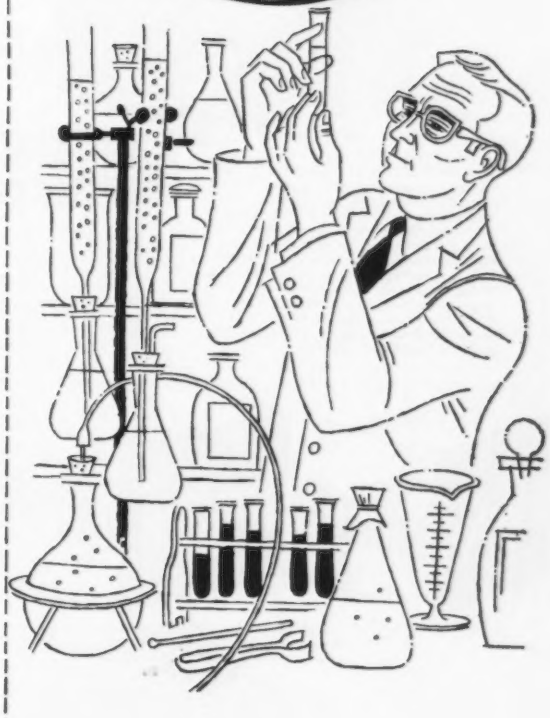

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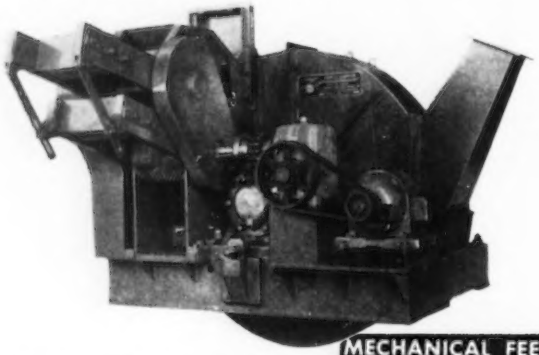

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**DEINKING CHEMICALS**
Antara Chemicals Division, General Dyestuffs Corp.
E. I. du Pont De Nemours & Co., Inc.
Jackson & Church Co.
Nopco Chemical Co.

**DE-MINERALIZING EQUIPMENT**
Hungerford & Terry, Inc.

**DENSOMETERS**
Testing Machines, Inc.
W. & L. E. Gurley

**DESIGN CONSTRUCTION**
Ebasco Services

**DETERGENTS**
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

**DEWAXING CHEMICALS**
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.

**DIGESTER CIRCULATING SYSTEMS**
Sandy Hill Iron & Brass Works

**DIGESTERS**
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Bauer Bros. Co.
Blaw Knox Company
Chicago Bridge & Iron Co.
Graver Tank Mfg. Co.
Pandia, Inc.
Pusey & Jones Corp.
A. O. Smith Corp.

**DISPERSING AGENTS**
Antara Chemicals Division, General Dyestuff Corp.
Arnold, Hoffman & Co., Inc.
Calgon, Inc.

Diamond Alkali Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp.
Michigan Alkali Div.

**DOCTORS**
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Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

**DOCTOR BLADES**
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Bird Machine Company
Black Clawson Company
John W. Bolton & Sons, Inc.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Westinghouse Electric Corp.

**DOCTOR OSCILLATORS**
Ronningen-Petter Co.

**DRIERS**
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Lukenweld
Mahon, R. C., Co.
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**DRIERS—LABORATORY**
Testing Machines, Inc.

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Manchester Machine Co.

**DRILLED SUCTION DRUM ROLLS**
Downingtown Mfg. Co.
Manchester Machine Co.

**DRIVES**
Appleton Machine Co.
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Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Horton Mfg. Co.
Jeffrey Mfg. Co
General Electric Company
Gibbs-Brower Company, Inc.
Link Belt Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**DRUM WINDERS**
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Downingtown Mfg. Co.
Manchester Machine Co.

**DRYER ROLL PYROMETER**
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Testing Machines, Inc.
Thwing-Albert Instrument Co.

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M. W. Jenkins Sons, Inc.
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Moore & White Co.
D. J. Murray Mfg. Co.
Waldron, John, Corp.

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**DYESTUFFS**
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuff Corp.

**ELECTRIC HYDROMETER**
Testing Machines, Inc.

**ELECTRIC HYGROMETER**
Thwing-Albert Instrument Co.

**ELECTRICAL PRECIPITATORS**
Research Corporation

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Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
John Waldron Corp.

**EMBOSSING ROLLS**
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Gibbs-Brower Company, Inc.
Holyoke Machine Co.
Hudson Sharp Machine Co.
B. F. Perkins & Son, Inc.
Stone, Thos. & Geo. M., Inc.
John Waldron Corp.

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Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp.

**ENZYMES**
Rohm & Haas Company
Vanderbilt Co., R. T.

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Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Westinghouse Electric Corp.

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Ronningen-Petter Co.

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General Electric Co.
B. F. Perkins & Son, Inc.
Roots-Connersville Div.
Ross Engineering Co., J. O.
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Merrick Scale Mfg. Co.

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Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Knox Woolen Company
Lockport Felt Co.
Morey Paper Mill Supply Co
Shuler & Benninghofen
Waterbury Felt Co.
Williams-Gray Co.

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Calgon, Inc.
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Downingtown Mfg. Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works

**FELT EXPANDERS**
Mount Hope Machinery Co.

**FELT GUIDES**
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Gilbert & Nash Co.
Moore & White Co.
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Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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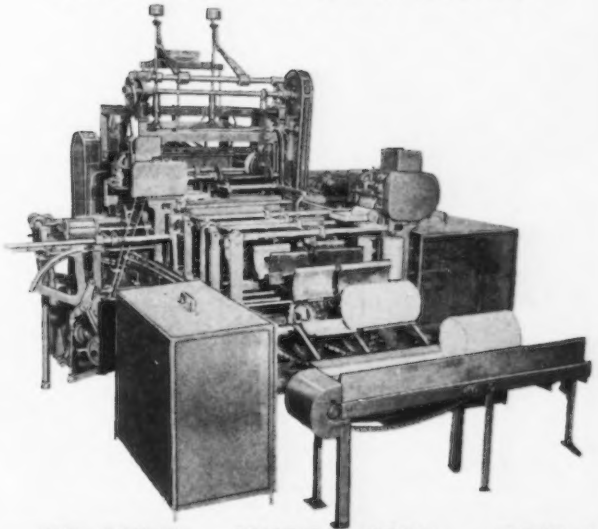

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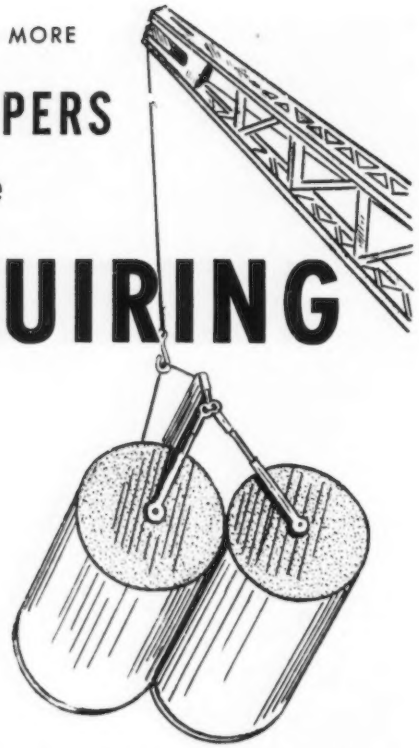

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Sandy Hill Iron & Brass Works
Waldron, John, Corp.

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Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Sun Oil Company
B. F. Goodrich Chemical Co.

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B. F. Goodrich Co.

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Taylor Instrument Cos.

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Westinghouse Electric Corp.
Williams Apparatus Co.

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Cram Associates
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Johnson Corp.
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Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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Ronningen-Petter Co.

**JORDANS**
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Ronningen-Petter Co.
Shartle Brothers Machine Co.

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Bahr Bros. Manufacturing Co.
John W. Bolton & Sons, Inc.
E. D. Jones & Sons Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

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John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

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Improved Machinery, Inc.
Sandy Hill Iron & Brass Works

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Bird Machine Company
Cady & Co., E. J.
Dilts Machine Works
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Hermann Mfg. Co.
Jackson & Church Co.
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Waldron, John, Corp.
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Hudson Sharp Machine Co.
Paper Converting Machine Co.
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Gibbs-Brower Company, Inc.
Hamblet Machine Co.
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Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Westinghouse Electric Corp.

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Black-Clawson Company
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Lukenweld
Manchester Machine Co.
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machinery Corp.
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Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

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The Moore & White Co.
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Langston Co., Samuel M.
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**PARAFFIN WAX EMULSIONS**
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Hercules Powder Co., Inc.
Nopco Chemical Co.

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Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
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Walworth Co.

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Pittsburgh Piping & Equipt. Co.

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Goodyear Tire & Rubber Co.

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Antara Chemicals Division, General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company

**PLASTICIZERS**
American Cyanamid Company Industrial Chemicals Company
Aktivin Division, Heyden Chemical Corp.
Arnold, Hoffman & Co., Inc.
B. F. Goodrich Chemical Co.
Jackson & Church Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Rohm & Haas Company

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Perkins & Son, Inc., B. F

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Babcock & Wilcox Co.
Emerson Mfg. Co.
Lukenweld Division
Lukens Steel Company
L. O. Ross Engrg. Corp.
Timken Roller Bearing Co

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Emerson Mfg. Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

**POPE TYPE REELS**
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Downingtown Mfg. Co.
Egan, Frank W., & Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

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E. I. du Pont de Nemours & Co.

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Black-Clawson Co.
Downingtown Mfg. Co.
Goodrich, B. F., Company, Inc.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Stowe-Woodward Inc.

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Hungerford & Terry, Inc.
Jackson & Church Co.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works

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Mahon, R. C., Co.
A. O. Smith Corp.

**PRESSES**
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Black-Clawson Company
Downingtown Mfg. Co.
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Heinrich, H. H., Co.
Hudson-Sharp Machine Co.
Jackson & Church Co.
Manchester Machine Co.
The Moore & White Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Testing Machines, Inc.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

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Horton Mfg. Co., Inc.
Sandy Hill Iron & Brass Works

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Testing Machines, Inc.
Thwing-Albert Instrument Co.

**PULP CLEANERS**
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Bird Machine Co.
Nichols Engrg. & Research Corp.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

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Shartle Bros. Machine Co.

**PULP SCREENS**
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Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

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Grinnell Company
Murray, D. J., Mfg. Co.
Record Fdy. & Mach. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

**PULP WASHERS**
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Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

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Bauer Brothers Co.
Cowles Company
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
Shartle Brothers Machine Co.

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Gottesman & Co., Inc.
Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Restigouche Co., Ltd.

**PULPSTONES**
Norton Company

**PULP TESTERS**
Testing Machines, Inc.

**PULP TREATING**
Curlator Corp.

**PULVERIZING MILLS**
Jeffery Mfg. Co.
F. L. Smidth & Co.

**PUMP VALVE BALLS**
Stowe-Woodward Inc.

**PUMPS**
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Apmew, Inc.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
DeLaval Steam Turbine Co.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Read Standard Corp.
Ronningen-Petter Co.
Roots Connersville Blower Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

**RADIANT BURNERS**
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**RAG CUTTERS**
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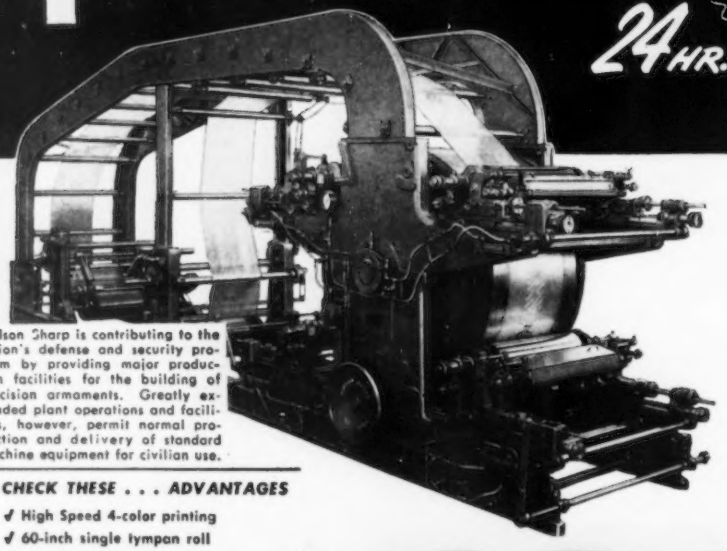
# FLEXOGRAPHIC PRINTING with COLOR CONTROL

## 24 HR. CONTINUOUS REGISTER WITHOUT ADJUSTMENT!



Hudson Sharp is contributing to the nation's defense and security program by providing major production facilities for the building of precision armaments. Greatly expanded plant operations and facilities, however, permit normal production and delivery of standard machine equipment for civilian use.

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Manufacturers, converters and commercial printers keep production moving with this modern press. Designed especially for accurate, continuous hair-line register on polyethylene, vinyls, plastic films, foils, cellophane and thin papers — where exceptional stretch and expansion is prevalent. Construction embodies single 60" diameter impression cylinder around which is mounted one to four color stations. In operation, web locks around cylinder to provide nearly *foolproof* register. Specially designed hydraulic web control maintains constant tension unwind and rewind throughout printing and drying. Write for complete details.

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Vulcan Copper & Supply Co.

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Beloit Iron Works
Black Clawson Company
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Hudson-Sharp Mch. Co.
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Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

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Bauer Brothers Co.
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Jackson & Church Co.
E. D. Jones & Sons Co.
Morden Machines Co.
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Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
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Apmew, Inc.
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Improved Machinery Inc.
Johnson Corp.
Poirier Control Company
Shartle Brothers Machine Co.
Taylor Instrument Companies
Westinghouse Electric Corp.

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B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company

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Beloit Iron Works
Black Clawson Company
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Frank W. Egan & Co.
Emerson Mfg. Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
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Holyoke Machine Co.
Lindsay Wire Weaving Co.
Lobdell United Co.
Manchester Machine Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
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Shartle Brothers Machine Co.
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Tyer Rubber Co.
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Valley Iron Works Co.
Waldron Corp., John

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U. S. Rubber Co.

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**ROLL STANDS**
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John Waldron Corp.
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Stowe-Woodward Inc.
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Potdevin Machine Co.
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Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

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Moore & White Co.
Ronningen-Petter Co.
Shartle Bros. Machine Co.
Walker Process Equipment, Inc.

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Merrick Scale Mfg. Co.
Testing Machines, Inc.

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Morey Paper Mill Supply Co.
Testing Machines, Inc.

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Appleton Machine Company
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Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Link Belt Co.

**SCREENS (Rotary)**
Bird Machine Company

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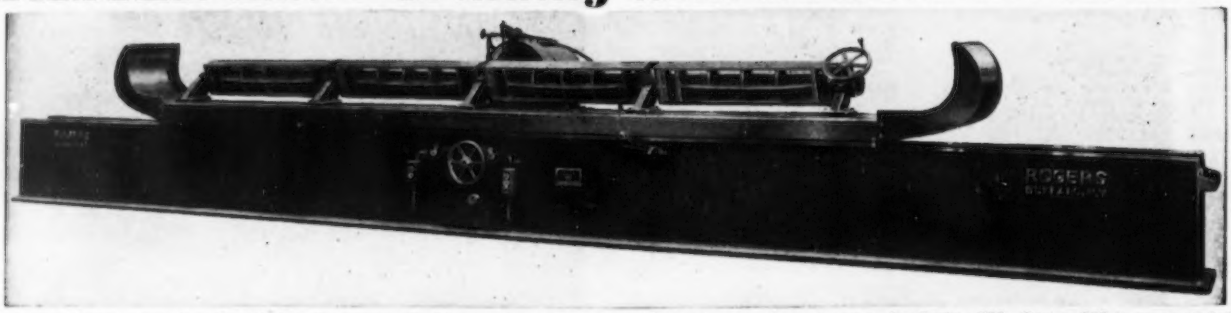

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Glidden Company
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
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Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Thwing-Albert Instrument Co.
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National Aluminate Corp.
Rohm & Haas Company
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Wyandotte Chemicals Corp., Michigan Alkali Div.

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Improved Machinery Inc.
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Moore & White Co.
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Paper Converting Machine Co.
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Waldron Corp., John

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Shartle Bros. Machine Co.
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**TAKE OFF UNITS**
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**TENSILE TESTERS**
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Moore & White Co.
D. J. Murray Mfg. Co.
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Valley Iron Works Co.
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Moore & White Co.
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Improved Machinery Inc.
Jackson & Church Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
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Link Belt Co.
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General Dyestuff Corp.
Hungerford & Terry, Inc.
National Aluminate Corp.
Palmer Filter Equipt. Co.
Ronningen-Petter Co.
The Sandy Hill Iron & Brass Works
Walker Process Equipment, Inc.

**WATER DISPERSIONS**
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Naugatuck Chemical Division of U. S. Rubber Co.
Rohm & Haas Company

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Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Machinery Inc.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works
Walker Process Equipment, Inc.

**WATER PENETRATION TESTER**
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Hungerford & Terry, Inc.
Wyandotte Chemicals Corp., Michigan Alkali Div.

**WATER TREATING EQUIPMENT**
Hungerford & Terry, Inc.
Ronningen-Petter Co.
Walker Process Equipment, Inc.

**WATER VAPOR CUPS**
Testing Machines, Inc.
Thwing-Albert Instrument Co.

**WATER WHEELS**
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Dilts Machine Works
Frank W. Egan & Co.
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Hudson Sharp Machine Co.
The Mayer Machine Co.
Moore & White Co.
Paper Converting Machine Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

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Egan, Frank W., & Co.
Waldron, John, Corp.

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Black-Clawson Company
Carthage Machine Co.
Downingtown Mfg. Co.
Improved Machinery Inc.
Moore & White Co.
Pusey & Jones Corp.
Ronningen-Petter Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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Rohm & Haas Company

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Antara Chemicals Division, General Dyestuff Corp.
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Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
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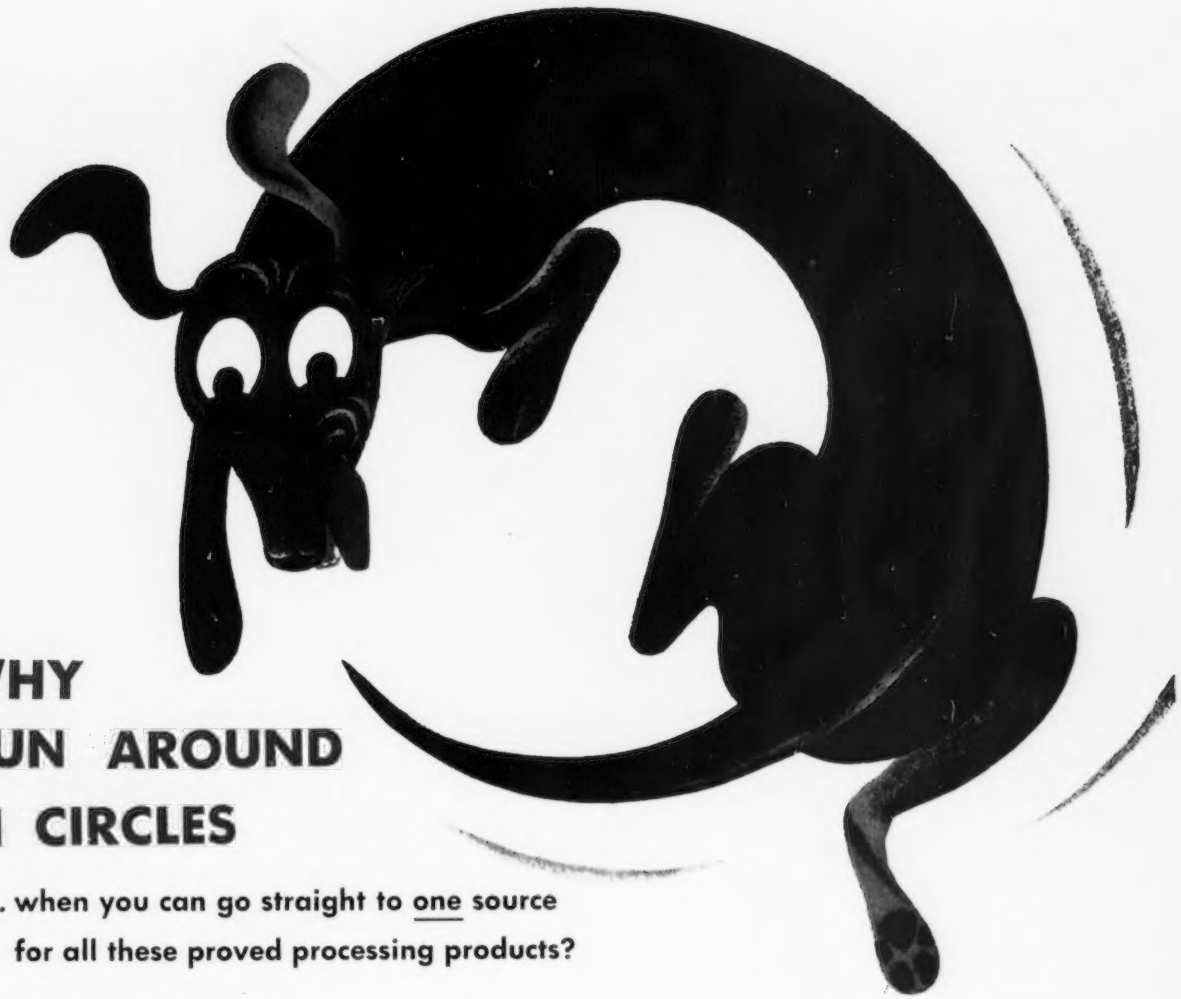

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